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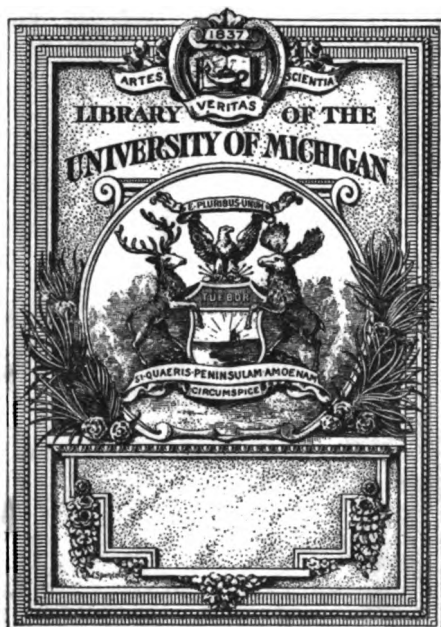
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GEOGRAPHICAL AND STATISTICAL NOTES ON MEXICO

BY

MATIAS ROMERO
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G. P. PUTNAM'S SONS
NEW YORK AND LONDON
The Knickerbocker Press
1898

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MATIAS ROMERO**

The Knickerbocker Press, New York

PREFACE.

I am printing in book form the several articles that I have published from time to time during my many years' residence in the United States, with a view to dispel errors prevailing here about Mexico, and so promote the good will and increase the commercial, political and social relations between the two countries. Those papers are preceded by one containing geographical and recent statistical information on Mexico, that I have not seen collected in any single book in the English language. To answer a great many demands for information that I constantly receive from citizens of this country, I have concluded to give at once that paper to the public.

WASHINGTON, *January* 31, 1898.

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MEXICO

CONTENTS.

	PAGE
GEOGRAPHICAL AND STATISTICAL NOTES ON MEXICO	I
PART I. GEOGRAPHY	3
Location, Boundaries and Area	5
Location	5
Boundary with the United States	5
Boundary with Guatemala	6
Boundary with Belize	6
Cession of Mexican Territory to the United States	7
General Characteristics	8
Geology	12
Mining	13
Silver	13
Real del Monte Company	15
New Mines, Topia	17
Li Hung Chang and the Mexican Silver Mines	18
Gold	19
Coinage of the Precious Metals	21
Coinage of Mexico from the Establishment of the Mints in 1537 to the End of the Fiscal Year 1896	21
Iron	21
Iron Foundries	22
Copper	22
Quicksilver	23
Coal	23
Mexican Miners	25
Mining Laws	25
Mints and Duties on Silver	27
Smelting Plants	28
Mexican Metallurgical Company	28
National Mexican Smelter at Monterey	28

	PAGE
Central Mexican Smelter	29
Velardeña Mining Company	29
The Chihuahua Mining Company	29
The Mazapil Copper Company, Limited	29
Sabinal Mining and Smelting Company, Chihuahua	29
La Preciosa	29
The Boleo Smelter	29
Orography	29
Hydrography	32
Climate	35
Summary of the Meteorological Observations Taken in Several Cities of Mexico during Several Years	38
Summary of the Meteorological Observations Taken in Several Localities of Mexico during the Year 1869	39
Mexico as a Sanitarium	41
Flora	42
Coffee	44
Sugar-cane	45
Tobacco	45
India-rubber	46
Cotton	48
Agave	48
Henequen	49
Pulque	49
Cactus	51
Cocoa	51
Vanilla	52
Silk Culture	53
Cochineal	53
Rice	53
Chicle, or Chewing-gum	53
Yuca	54
Ginger	55
Canaigre	55
Peppermint	55
Cabinet and Dye Woods	55
Grasses	56
Alfalfa	56
Cattle-raising	56
Sheep	58
Products of Cold and Temperate Regions	58
Fruits	58
Oranges	59
Lemons	60

Contents.

vii

	PAGE
Limes and Shaddocks	61
Bananas	61
Pineapple	62
Cocoanut	62
Mangoes	63
Alligator Pear	63
Mamey	63
Zapote	63
Papaya	63
Flowers	63
Irrigation	64
The Nazas Irrigation	67
Fauna	70
Ethnology	72
Mexican Indians	72
Increase of Mexican Population	76
Decrease of the Indian Population	77
The Spaniards in Mexico	78
English and Germans in Mexico	79
Americans in Mexico	79
Ruins	80
Uxmal	80
Palenque	81
Cholula	81
Teotihuacan	81
Mitla	83
Languages	85
Synopsis of the Indian Languages of Mexico according to Don Francisco Pimentel	86
Population	89
Classification of Mexican States	90
Area and Population of the United Mexican States	91
Religion	92
Protestantism in Mexico	95
Political Organization	98
Political Division	99
Army and Navy	99
Education	100
Universities Established by the Spanish Government	101
School of Medicine	102
School of Engineering	103
Mexican Technical Schools in the Present Time	103
Reorganization of the Technical Colleges	104
Primary Education	104

	PAGE
School Statistics	105
Libraries	106
Newspapers	106
The Valley of Mexico	106
The City of Mexico	107
Climate	110
Mortality in the City of Mexico	111
Climatological Data of the City of Mexico	112
Summary of the Meteorological Observations of the City of Mexico in 1896	113
Railways	115
President Diaz's Railway Policy	117
President Diaz's Statistics on Mexican Railways	118
Financial Condition of Mexican Railways	119
Annual Buildings and Earnings of Mexican Railways	120
Approximate Tonnage Moved by Central, National, Inter- oceanic, and Mexican Railways for Ten Years ended December 31, 1896	121
Telegraphs	121
Postal Service	123
Public Lands	124
Immigration	125
Immigration from the United States	126
Public Debt	129
Banking	131
Patents and Trademarks	132
Patents	132
Trademarks	132
Shipping and Communications	133
Money, Weights, and Measures	133
Non-Official Publications (English)	134
 PART II.—STATISTICS	 135
Revenues and Expenses	137
Revenue and Expenses of the Federal Government of Mexico in 1808 and from 1822 to June 30, 1867	139
Revenue and Expenses of the Mexican Government from July 1, 1867, to June 30, 1888	140
Revenue and Expenses of the Mexican Government from July 1, 1888, to June 30, 1896	141
Federal Appropriations during the Fiscal Years from 1868 to 1895	142
Sources of Revenue	143
Import Duties	143

Contents.

ix

	PAGE
Additional Import Duties	144
Export Duties	144
Amount of Import Duties	144
Custom Receipts from 1823 to 1875	145
Internal Revenue	146
Receipts of the Custom Houses during the Twenty-seven Fiscal Years Ending June 30, 1896	147
Internal Revenue Receipts from January 1, 1875, to June 30, 1896	148
Direct Taxes	148
Receipts from Direct Taxes in the Federal District during the Twenty-seven Fiscal Years Ending June 30, 1896	149
Revenues of the Mexican States from 1884 to 1895	150
Expenses of the Mexican States from 1884 to 1895	151
Revenues of the Municipalities of Mexico from 1884 to 1895	152
Expenses of the Municipalities of Mexico from 1884 to 1895	153
State and Municipal Finances	154
Foreign Trade	155
Imports	155
Mexican Imports and Exports from 1826 to 1828	155
Imports in Mexico from July 1, 1872, to June 30, 1875, and in the year 1884-1885	156
Imports in Mexico from July 1, 1885, to June 30, 1886, and from July 1, 1888, to June 30, 1890	157
Imports in Mexico from the Fiscal Year 1892-1893, to the Fiscal Year 1895-1896	158
Exports	159
Imports in Mexico by Countries in the Fiscal Years 1888-1889 and 1889-1890, and Imports and Exports by Countries and Custom Houses in the Fiscal Years 1894-1895 and 1895-1896	160
Exports of Mexican Commodities from July 1, 1886, to June 30, 1896	162
Statement of Exports of some Agricultural Products during the Fiscal Years from July 1, 1877, to June 30, 1896	164
Value of Imports from Mexico from July 1, 1882, to June 30, 1892	165
Resumé of Total Imports	167
Destination and Value of Exports from Mexico in the Fiscal Years from 1882 to 1892	168
Total Exports	169
Trade between Mexico and the United States	170
Total Imports to Mexico and Imports from the United States for the Fiscal Years 1872-1873 to 1895-1896	172

	PAGE
Total Exports from Mexico and the Exports to the United States from 1877-1878 to 1895-1896	173
Statement of the Commercial Transactions between Mexico and the United States from 1826 to 1850	173
Commerce in Merchandise between the United States and Mexico by Years and Decades from 1851 to 1897	174
Total Commerce between the United States and Mexico by Years and Decades from 1851 to 1897	175
Quantities and Values of the Principal and all other Articles of Imports into the United States from, and of Exports from the United States to, Mexico, 1858-1883	176
Quantities and Values of the Principal and all other Articles of Imports into the United States from, and of Exports from the United States to, Mexico, from 1889-1897	181
Increase of Trade during the year 1896-1897	184
Leading Merchandise Imports from Mexico	184
Exports from the United States to Mexico	184
Tropical Products Supplied by Mexico to the United States	185
Cattle Exported to the United States	186
Coinage	186
Coinage by the Mexican Mints from their Establishment in 1535 to June 30, 1895	187
Production of Gold and Silver in Mexico in 1879-1880, 1889-1890, and 1894-1895	188
Export of Precious Metals and Minerals from Mexico in the years 1879-1880, 1889-1890, and 1894-1895	188
Exports of Silver from July 1, 1872, to June 30, 1896	190
Mexican Gold Exports	190
Mexican Gold Exported to the United States	191
Imports of Gold Bullion, Ore, and Coin from Mexico into the United States from 1891 to 1895	191
Imports of Gold Bullion, Ore, and Coin from Mexico into the United States from 1892 to 1896	191
Gold Exported from Mexico to the United States from 1891 to 1896	192
Railways	193
Statement by the Department of Communications of Mexico of the Railroad Mileage in Operation on October 31, 1896	193
Resumé of Railways in Mexico in 1895	195
Mexican Central	196
Mexican National	196
Earnings and Expenses of the Mexican National from 1889 to 1896	198

Contents

xi

	PAGE
Mexican International	199
Mexican Southern	200
Other Railroads	201
Mexican Railroad	201
Interoceanic Railway	202
Sonora Railway	202
Hidalgo and Northeastern Railway	202
Mérida and Progreso Railway	203
Tehuacan and Esperanza Railway	203
Mérida and Peto Railway	203
Sinaloa and Durango (Altata to Culiacan) Railway	204
Mérida and Campeche Railway	204
Mérida and Valladolid Railway	204
Tlalmanalco Railway	205
San Juan Bautista and Carrizal Passenger Railway	205
San Andrés and Chalchicomula Railway	205
Orizaba and Ingenio Railway	206
Santa Ana and Tlaxcala Railway	206
Cárdenas and Rio Grijalva Railway	206
Toluca and San Juan de las Huertas Railway	207
Vanegas, Cedral, Matehuala, and Rio Verde Railway	207
Mérida and Izamal Railway	207
San Marcos and Nautla Railway	207
Monterey and Gulf Railway	208
Córdova and Tuxtepec Railway	208
Maravatío and Cuernavaca Railway	208
Salamanca and Santiago Valley Railway	208
Monte Alto Railway	209
Valley of Mexico Railway	209
Puebla Industrial Railway	209
Mexican Northern Railway	209
Mexico, Cuernavaca, and Pacific Railway	209
Federal District Tramways	210
Veracruz and Alvarado Railway	210
Total Traffic and Receipts of Mexican Railways	210
Traffic and Receipts of the Mexican Railways	211
Railway Subsidies Paid by the Mexican Government	211
Subsidies Paid by the Mexican Government to Railway Companies up to June 30, 1896	212
Detailed Statement of the Subsidies Paid by the Mexican Government to the Railway Companies	213
1. Mexican Railway	213
2. Hidalgo Railway	213
3. Veracruz & Alvarado Railway	213

	PAGE
4. Mérida & Peto Railway	213
5. InterOceanic Railway	214
6. Occidental Railway	214
7. Mexican Central and sundry branches	214
8. Mexican National and branches	215
9. Sonora Railway with a branch	216
10. Mérida & Valladolid Railway with a branch	216
11. Mérida & Campeche Railway <i>via</i> Kalkini	216
12. San Marcos & Nautla Railway	216
13. Toluca & San Juan de las Huertas Railway	217
14. Vanegas, Cedral, Matchuala, & Rio Verde Railway	217
15. Jimenez & Sierra Madre Railway	217
16. Mexican Southern Railway	217
17. Tonalá & Frontera Railway	217
18. Monterey & Mexican Gulf Railway	218
19. Tecolula & Espinal Railway	218
20. Pachuca & Tampico Railway	218
21. Maravatio & Iguala Railway	218
22. Mexican Northeastern Railway	218
23. Veracruz & Boca del Rio Railway	219
24. Tula, Zacualtipán & Tampico Railway	219
25. Matamoros, Izucar, & Acapulco Railway	219
26. Lower California Railway	219
27. Monte Alto Railway	219
28. Tehuantepec Railway	219
1. Contractors, Edward Learned & Co.	219
2. Contractor, Mr. Delfín Sanchez	220
3. Mac-Murdo Contract	220
4. Stanhope, Hampson, & Corthel Contract	220
Public Debt	221
Statement of the National Debt of Mexico to June 30, 1896	221
Statement of the Federal Public Debt on June 30, 1896	222
Post-Office and Telegraph Service	223
Post-Offices in Mexico in 1895 by States	223
Earnings and Expenditures of the Post-Office and Telegraph Services from July 1, 1869 to June 30, 1896	224
Number of Pieces Transported by Mexican Mails from 1878- 1879 to 1894-1895	225
Banks	225
List of Mexican Banks	225
Situation of the Mexican Banks on December 31, 1894	226
Public Lands	226
Free Titles of the Indian-town lands issued to the inhabitants from 1877 to 1895	227

Contents.

xiii

	PAGE
Titles issued for unwarranted possession of Public Lands by Private Parties in 1894 and 1895	227
Titles of public lands issued to Private Parties in 1894 and 1895	227
Titles issued in 1894 and 1895 to Surveying Companies	228
Education	228
Newspapers Published in Mexico in 1895	228
Public Schools supported by the Federal, State, and Muni- cipal Administrations in 1895	229
Schools supported by Private Parties	231
Public Libraries in Mexico	233
Manufacturing Establishments in Mexico in 1893	233
Summary of Factories existing in Mexico in 1893	236
Navigation	237
Vessels arrived at Mexican Ports in 1895	238
Vessels departed from Mexican Ports in 1895	239
Resumé of arrivals and departures from 1885 to 1895	239
Foreign Passengers arrived at Mexican Ports in 1895	240
Foreign Passengers departed from Mexican Ports in 1895	241
General resumé of Passengers arrived and departed by Port and Rail in 1895	242
Vessels arrived at and departed from Mexican Ports during the Fiscal Years 1894-95 to 1895-96	243
Agricultural Products :	
Resumé of Agricultural Products in Mexico	243
Conclusion	244
ADDENDA	245
Federal Revenue and Expenses of Mexico in the Fiscal Year 1896-97	245
Imports and Exports of Mexico by Countries and Custom- Houses in the Fiscal Year 1896-97	246
Trade between Mexico and the United States during the first nine months of the Calendar Year 1897	247
Mexican Exports to the United States	247
Mexican Imports from the United States	248
APPENDIX	249
Mexico as a Central American State	249
Five States of Central America	250
Mexico	251
Geographical Extension of Central America	251

	PAGE
Mexican Profiles	253
From Veracruz to Mexico by Orizaba, by the Mexican Railway	253
From Apizaco to Puebla, a branch of the same road	253
From Veracruz to Mexico, by the Interoceanic Railway	254
From the City of Mexico to Morelos, a branch of the same road	254
From Puebla to Izucar de Matamoros, a branch of the same road	255
From Mexico to El Paso del Norte or Ciudad Juarez by the Central Mexican Railroad	255
From Aguascalientes to Tampico, a branch of the same road	257
From Irapuato to Guadalajara, a branch of the same road	258
From Mexico to Laredo Tamaulipas by the Mexican Na- tional Railway	258
From Acámbaro to Pátzcuaro, a branch of the same road	261
From Piedras Negras or Ciudad Porfirio Diaz to Durango, by the Mexican International Railway	261
From Sabinas to Hondo, a branch of the same road	262
From the City of Mexico to Cuernavaca and Acapulco	262
From Puebla to Oaxaca, by the Mexican Southern Railway	263
From Coatzacoalcos to Salina Cruz, by the National Te- huantepec Railway	263
From the City of Mexico to Pachuca, by the Hidalgo and Northeastern Mexican Railway	264
Northeastern Railway from Mexico to Tizayuca	264
Hidalgo Railway to Tuxpan	264
From Tepa to Pachuca, a branch of the Hidalgo Rail- way	264
From San Augustin to Irolo, a branch of the Hidalgo Railway	264
Bridle-Path from Durango to Mazatlan	265
Wagon Road from Manzanillo to Guadalajara	265
Wagon Road from Tehuacan to Oaxaca and Puerto Angel	266
 THE VALLEY OF MEXICO'S DRAINAGE	 266
Topographical Conditions of the Valley of Mexico	267
Work done by the Indians	267
Work done by the Spaniards	269
Work done by the Mexican Government	274
The Tunnel	276
The Canal	277
The Sewage	279
Completion of the work	279

**GEOGRAPHICAL AND STATISTICAL NOTES
ON MEXICO**

GEOGRAPHICAL AND STATISTICAL NOTES ON MEXICO.¹

(Corrected to June 30, 1897.)

FOR a long time past I have felt the need of a short treatise containing geographical and statistical information about Mexico, to answer the many queries received on that subject by the Mexican Legation in Washington. A statistical abstract about Mexico, such as most nations publish every year, is greatly needed, especially now when the attention of business men and young men is awakening to the possibilities of Mexico. It was partly with the purpose of supplying that need that I prepared this article, which will, I hope, at least serve

¹ This article first appeared in the *Bulletin of the American Geographical Society of New York* of December 31, 1896. A club of the City of Washington requested me, in January, 1888, to deliver a lecture on Mexico, and, as I had not time to prepare one, I consented to give an informal talk on the subject, which I did on January 16th of that year. Most of my talk was taken down by a stenographer, and was the basis of the article which appeared in the *Bulletin of the American Geographical Society of New York*. That Society did me the honor of electing me one of its honorary members, at the request of Honorable Frederick A. Conkling, on January 25, 1870, and I have ever since felt that I owed it a debt which I could only pay by sending it a contribution about Mexico. The pressure of my official duties in Washington on the one hand, and my inability to treat properly the many subjects connected with a description of Mexico, added to the difficulty of compressing them into a few pages; on the other, delayed that work much longer than I desired or expected. I have added considerably to this article in the present edition, especially in that part which embraces statistical information about Mexico, and I am sure that in so far as concerns the fulness of that information and the most recent data, my article stands above any previous publication on the subject.

2 Geographical and Statistical Notes on Mexico.

to call attention to that country, and awaken a desire for reading other and better monographs and books on Mexico written by more competent men. I have borrowed from the descriptions of others, especially in what appears under the heading of Geology, Geography, and Fauna.

PART I.

GEOGRAPHY

I. GEOGRAPHY.

LOCATION, BOUNDARIES, AND AREA.

Location.—Mexico is situated between $14^{\circ} 30' 42''$ and $32^{\circ} 42'$ north latitude, and between $86^{\circ} 46' 8''$ and $117^{\circ} 7' 31'' 89$ longitude west of the meridian of Greenwich, embracing therefore $18^{\circ} 11' 18''$ of latitude and $30^{\circ} 21' 23'' 89$ of longitude. It has an area of 767,326 square miles. It is bounded on the north by the United States of America, on the southeast by Guatemala and Belize, on the south and west by the Pacific Ocean, and on the north and east by the Gulf of Mexico and the Carribean Sea.

Boundary with the United States.—The boundary with the United States is fixed by the treaties of February 2, 1848, and December 30, 1853, and begins at the mouth of the Rio Grande River on the Gulf of Mexico, follows the river for 1136 miles, beyond El Paso, Texas, to the point where it strikes parallel $31^{\circ} 47'$ north latitude, and from there runs along said parallel for a distance of one hundred miles, and thence south to parallel $31^{\circ} 20'$ north latitude; from there west along this parallel as far as the 111th meridian of longitude west of Greenwich; thence in a straight line to a point on the Colorado River, twenty English miles below the junction of the Gila; thence up the middle of the said River Colorado to the intersection with the old line between Upper and Lower California, and thence to a point on the Pacific Ocean, distant one marine league due south of the southernmost point of the Bay of San Diego; the total distance from El Paso to the Pacific being 674 miles. The whole extent of the boundary line between the two countries is 1833 miles.

The boundary line with the United States runs from southeast to northwest, the mouth of the Rio Grande being in $25^{\circ} 57' 14'' 74''$ north latitude; while the line reaches on the Pacific latitude $32^{\circ} 32' 1' 34''$; the point where the boundary line strikes the Colorado River is farther north, reaching $32^{\circ} 42'$ of north latitude. Mexico has, therefore, on the western, or Pacific side, $6^{\circ} 34' 46'' 20''$ of latitude more than on the eastern or the Gulf of Mexico side.

Boundary with Guatemala.—The boundary with Guatemala is fixed by the treaties of September 27, 1882, and April 1, 1895, and runs from a point on the Pacific coast three leagues distant from the upper mouth of the River Zuchiate, and thence, following the deepest channel thereof, to the point at which it intersects the vertical plane which crosses the highest point of the volcano of Tacaná, and distant twenty-five miles from the southernmost pillar of the gate of Talquian, leaving that gate in the territory of Guatemala; the determinate line by the vertical plane defined above until it touches the River Zuchiate at the point of its intersection with the vertical plane which passes the summit of Buenavista and Ixbul; the determinate line by the vertical plane which passes the summit of Buenavista, determined by the astronomical observations, and the summit of the Ixbul hill from where it intersects the former to a point four kilometres beyond said hill; thence to the parallel of latitude which crosses the last-named point, and thence eastward until it reaches the deepest channel of the Chixoy up to its junction with the Usumacinta River, following that river until it reaches the parallel situated twenty-five kilometres to the south of Tenosique in Tabasco, to be measured from the principal square of that town; the parallel of latitude referred to above, from its intersection with the deepest channel of the Usumacinta, until it intersects the meridian which passes at one third of the distance between the centres of the Plazas of Tenosique and Sacluc, this distance being calculated from Tenosique; from this meridian, from its intersection with the parallel above mentioned to the latitude of $17^{\circ} 49'$; and from the intersection of this parallel with the latter meridian indefinitely toward the east.

The southern end of the Guatemalan line on the Pacific is in $14^{\circ} 24'$ north latitude, while the northern end, on the Caribbean Sea, is in $17^{\circ} 49'$ north latitude, being a difference of $3^{\circ} 25'$ in favor of the latter. The calculated length of the southern boundary is 642 miles.

Boundary with Belize.—To the southeast of Yucatan extends the territory of Belize, occupied by a British settlement under a permit granted to them by the Spanish Government to cut wood within the limits mentioned in the treaty concluded between the Kings of Great Britain and Spain on November 3, 1783, and amended on July 14, 1786.

British Honduras, according to Mr. George Gil, F.R.G.S., in his book, "British Colonies," published in London in 1896, was declared a separate colony of Great Britain, under a Lieutenant-Governor subordinate to the Governor of Jamaica, in the year 1862, previous to which time it had been a dependency of Jamaica. In 1884 a Governor and Commander-in-Chief was appointed, by Letters Patent, and thus the colony became independent of Jamaica. On April 30, 1859, Great

Britain signed a treaty with Guatemala, within whose boundaries most of British Honduras was situated, defining the boundary of that colony.

The limits between Mexico and Belize are defined by a treaty signed at the City of Mexico on July 8, 1893, and ratified by the Mexican Senate on April 19, 1897, and begin at the mouth of Bocalarchica—a strait which separates the State of Yucatan from Ambergris Key and adjacent islands, runs along the centre of the channel between said islands and the mainland, in a southeasterly direction, until it reaches the parallel $18^{\circ} 9'$ north latitude; thence northwesterly at an equal distance between two keys marked on the map annexed to the treaty, to meet the parallel $18^{\circ} 10'$ north latitude; thence, turning toward the west, along the neighboring bay, as far as $88^{\circ} 2'$ west meridian, thence toward the north until it reaches the parallel $18^{\circ} 25'$ north latitude, thence it runs toward the west as far as meridian $88^{\circ} 28' 32''$ north, this point being the mouth of the Hondo River; thence following its deepest channel, passing to the west of Albion Island and running up the Arroyo Azul until the latter stream crosses the meridian of the Garbutt Falls at a point north of the boundary lines of Mexico, Guatemala, and British Honduras; and from that point following the meridian of Garbutt Falls, running in a southerly direction up to $17^{\circ} 49'$ north latitude which is the boundary line between Mexico and Guatemala, leaving the so-called Snoska or Knobba River in a northerly direction and in Mexican territory.

Cession of Mexican Territory to the United States.—Mexico has ceded to the United States, by the treaty of Guadalupe-Hidalgo of February 2, 1848, and the Gadsden Treaty of December 30, 1853, 930,590 square miles, comprising over one-half of her former territory. The same cession is considered in the United States under three heads—first under the boundary treaty signed in Washington on April 25, 1838, between the United States of America and the Republic of Texas, under which Texas was annexed to the United States in 1845; second, under the cession of the Guadalupe-Hidalgo Treaty, and the third under the Gadsden Treaty.

As Mexico did not recognize the independence of Texas until the treaty of Guadalupe-Hidalgo was signed, we consider that she only gave her consent to that annexation by said treaty, and therefore that the cession of territory made then to the United States embraced also Texas.

Mr. S. W. Lamoreaux, former Commissioner of the General Land Office, published in 1896 a map of the United States, which contained in detail the different sections of territory annexed to the same in different periods from France, Spain, Mexico, and Russia, where the Mexican annexations are clearly defined. From official data of that office, I take the following figures representing the area of each of the Mexican cessions:

Geographical Notes on Mexico.

First, annexation of Texas, which embraces in whole or in part the following States and Territories :

	Sq. Miles.
Texas	265,780
Colorado, in part	18,000
Kansas, in part.....	7,766
New Mexico.....	65,201
Oklahoma.....	5,740
Total	362,487

Second, cession by the Guadalupe-Hidalgo Treaty, embracing in whole or in part the following States and Territories :

	Sq. Miles.
Arizona	82,381
California	157,801
Colorado, in part.....	29,500
Nevada	112,090
New Mexico.....	42,000
Utah.....	84,476
Wyoming, in part.....	14,320
Total	522,568

Third, cession by the Gadsden Treaty, containing additions to the following Territories :

	Sq. Miles.
Arizona	31,535
New Mexico.....	14,000
Total	45,535

Grand Total in Square Miles..... 930,590

General Characteristics.—Mexico is bounded on the east by the long curve of the Gulf of Mexico and by the Caribbean Sea, and its eastern coast is 1727 miles long ; on the west it is washed by the Pacific Ocean, its coast describing the arc of a still larger circle, for a length of 4574 miles ; but after passing the latitude of the City of Mexico, about the meridian 19° of north latitude, going south, the continent makes a decided turn towards the east, the Gulf of Mexico forming the northern border, and the Pacific Ocean the southern border.

Mexico has the shape of a cornucopia, with its narrowest end tapering toward the southwest, its convex and concave sides facing

the Pacific and the Atlantic, respectively, and its widest end toward the north, or the United States. I look forward to the time, which I do not think far distant, considering our continuity of territory to the United States and our immense elements of wealth, when we shall be able to provide the United States with most of the tropical products, such as sugar, coffee, tobacco, india-rubber, etc.,¹ which they now import from several other countries.

The widest portion of Mexico is, therefore, its northern extremity, or its boundary with the United States. The narrowest point is the Isthmus of Tehuantepec, about one hundred miles from one ocean to the other; and after passing it the country expands again to the south-east towards Yucatan and Chiapas until it reaches the boundary with Guatemala and Belize.

Yucatan resembles but little in its configuration Mexico proper, as it is a level country formed by coral reefs and beds, and whose ruins show it to have been the seat of a high civilization and an advanced people.

Although the greater part of Mexico is on the North American continent proper, as the Isthmus of Panama divides North from South America, a large portion of it lies in Central America. Geographically speaking, Central America is the portion of North America embraced between the Isthmus of Tehuantepec and Panama, and of this vast territory Mexico holds about one-third. In a paper published in the *Bulletin of the American Geographical Society of New York*, of March 31, 1894, I dealt especially with this subject.²

The broken surface of Mexico formerly made travelling there very difficult, for which reason the country was but little known, even by Mexicans themselves, as its configuration did not allow of the building of good roads, and to travel any considerable distance it was necessary to go by mule paths, without comfortable inns, and running great risks, owing to the disturbed condition of the country. It required, therefore, time, expense, endurance, and an object in view to travel widely there. I was always desirous of knowing as much as possible of the country, and I have made long trips, many of them on horseback, solely for the purpose of studying certain regions, and I think that before the railway era, I was perhaps one of the Mexicans who knew

¹ In his *Notes on Mexico*, Lempriere, a distinguished traveller and historian, says: "The merciful hand of Providence has bestowed on the Mexicans a magnificent land, abounding in resources of all kinds—a land where none ought to be poor, and where misery ought to be unknown—a land whose products and riches of every kind are abundant and as varied as they are rich. It is a country endowed to profusion with every gift that man can desire or envy; all the metals from gold to lead; every sort of climate, from perpetual snow to tropical heat, and of inconceivable fertility."

² A copy of that paper is appended to this article.

most of the country and who could, therefore, most clearly realize the difficulty of knowing it thoroughly. From this it can be readily understood how difficult it would be for a foreigner, without any previous knowledge of the country and ignorant of its language, to know it by a few days' sojourn there. Yet many travellers who have been in Mexico only a few days write about it on their return home, just as if they knew it perfectly, making necessarily many serious and sometimes laughable mistakes.

The natural beauties of Switzerland are well known ; but to me that country is hardly to be compared with Mexico, as everything in Mexico is on a much grander scale. In the latitude in which Switzerland is situated the snow line is quite low, and, therefore, most of the peaks of the Swiss mountains, while not so high as the Mexican mountains, are covered with perpetual snow, which embellishes the country, and which, melting in summer, supplies the beautiful lakes of that country with fresh water. Therefore, only in the beauty of many snow peaks, beautiful fresh-water lakes, good roads, and fine hotels has Switzerland the superiority over Mexico.

Historians, travellers, and writers of the present day compare Mexico with Egypt. There is no doubt that between the legends and romance with which the history of each of these countries abounds there is a striking resemblance. The pyramids and ancient relics in the form of buildings, images, and undeciphered hieroglyphics on stones, coins, etc., found in both countries, all contribute to the general belief that, centuries ago, the people of Mexico and Egypt were connected by some tie, were in some way of the same race and had the same ideas. To-day in Mexico, the manner of living, of cultivating the soil, and many other peculiarities in the manners and customs of the Mexican people forcibly remind the traveller of Upper and Lower Egypt.¹

¹ In a very bright article about Mexico by Mr. Charles Dudley Warner, published in *Harper's Illustrated Monthly Magazine* for June, 1897, I find the following sentence supporting my assertion :

"In the cities he is reminded of Spain, and often of Italy (since the Catholic Church prevails), but in the country and in small towns the appearance is Oriental, or rather Egyptian. This resemblance to Egypt is due to the color or colors of the inhabitants, to the universal use of the donkey as a beast of burden, to the brown adobe walls and mud huts covered with cane, to the dust on the foliage, the clouds of dust raised in all the highways, and to a certain similarity of dress, so far as color and rags can give it, and the ability of men and women to squat all day on the ground and be happy."

Mr. Theodore W. Noyes, of Washington, in a descriptive article on Mexico, published in December, 1895, makes the following parallel between Mexico and Egypt :

" . . . The Egyptian shaduf finds its counterpart in the well sweep of Irapuato where strawberries are grown and sold every day in the year, and where irrigation is resorted to, systematized, and on a grand scale. In the absence of trees and rocks

I, myself, although I have only visited Lower Egypt, and that as a tourist in a very hasty manner and for a very few days, was greatly struck by the great similarity that I found between the two countries and between the habits of the native Egyptian and the Mexican Indians. The Egyptian plows are used by the Mexican Indians, and they are drawn in Mexico as in Egypt by oxen whose yokes are fastened to their horns, while in other countries they are fastened on their necks. Several of the agricultural products of Egypt and Mexico are exactly the same, and the way in which foods are prepared in both countries is, too, very similar; and I also found similar traits and race characteristics between the Egyptian Copts and some tribes of the Mexican Indians.

The great difference between Egypt and Mexico is that Mexico lacks "irrigation," which has made Egypt—that small corner of the earth—the most remarkable and productive country in the world. Owing to the great stretch of latitude from the Rio Grande to the Guatemala boundary, everything that grows in Egypt, and in fact in any other part of the world, can be produced in Mexico by the aid of irrigation.

the Egyptian shaduf is small, is composed of prepared timbers, and the counterpoise to the well bucket is an immense chunk of dried, hardened Nile mud. The Mexican shaduf utilizes a forked tree and swings across it a long tapering tree trunk or branch, and the counterpoise consists of a large sink stone or mass of stones fastened together. Although Mexico stretches farther south than Egypt, the two countries lie, generally speaking, between the same parallels of latitude, but the altitude of Irapuato is 5000 feet above the sea-level of the Nile, so that the same degree of undress is not expected or found in the Mexicans as in the Egyptian shaduf workers. I saw, however, in the neighborhood of Irapuato two Indians at well sweeps working side by side who were dressed only in white cotton loin cloths, who looked like the twin brothers of shaduf workers whom I have seen photographed on the Nile. . . . The water-carrier of Cairo is much like his brother of Guanajuato, where a long earthen jar is used. The groups about the fountains with jars of water bodily borne on the women's heads or on a protecting turban-like ring, or balanced on the men's shoulders, are also Oriental. Corn is ground between two stones in Asiatic fashion.

"Egyptian sand spouts are common. Also Egyptian types of domestic utensils of pottery. The Mexican woman with a baby at her back securely fastened in the reboso, which throws the infant's weight on the mother's shoulders, is to be compared with the Egyptian woman whose reboso covers her face while the child straddles her shoulders, holding to her head and leaving her hands unfettered as in the Mexican fashion. There are no Egyptian camels, but even more numerous donkeys, the patient burros. The Indian villages, either of adobe or bamboo, the thatched roofs and organ cactus fences, and alive with goats, donkeys, or snarling curs, are African in effect. There Aztecs picture writings resemble the Egyptian, the paper being made from the maguey instead of the papyrus. The Aztecs employed captives on great public works as in Egypt. Mexico thus has pyramids with much broader base than those of Egypt, though not nearly so high, and idols quite as ugly. Gold ornaments, beads, and other highly prized antiquities are found in the tombs as in Egypt."

GEOLOGY.

The geology of Mexico has been but imperfectly studied. In the higher ranges the prevailing formations are granite, which seem also to form the foundations of the plateaus, above which rise the traps, basalts, mineral-bearing porphyries, and more recent lavas. Hence, Lyell's theory that Mexico consisted originally of granite ranges with intervening valleys subsequently filled up to the level of the plateaus by subterranean eruptions. Igneous rocks of every geologic epoch certainly form to a large extent the superstructure of the central plateau. But the Mexican table-land seems to consist mainly of metamorphic formations which have been partly upheaved, partly interpenetrated, and overlaid by igneous masses of all epochs, and which are chiefly represented by shales, greywacke, greenstones, silicious schists, and especially unfossiliferous limestones. All these formations are alike remarkable for the abundance and variety of their metalliferous ores, such as silver, silver glance, copper, and gold. Gneiss and micaceous schists prevail in Oaxaca and on all the southern slopes facing both oceans. But the highest ranges are formed mainly of plutonic and volcanic rocks, such as granites, syenites, diorites, mineral-bearing trachytes, basalts, porphyries, obsidian, pearlstone, sulphur, pumice, lavas, tufa, and other recent volcanic discharges. Obsidian (itzli) was the chief material formerly used by the natives in the manufacture of their cutting implements, as shown by the quarries of the Cerro de las Navajas (Knife Cliff), near Real del Monte and Pachuca in the State of Hidalgo. Vast deposits of pumice and the purest sulphur are found at Huichapam and in many of the craters. But immeasurably the most valuable rocks are the argentiferous porphyries and schists of the central plateau and of Sinaloa, unless they are destined to be rivalled by the auriferous deposits of Sonora. Horizontal and stratified rocks, of extremely limited extent in the south, are largely developed in the northern states, and chalk becomes very prevalent towards the Rio Grande and Rio Gila valleys. To this chalk and to the sandstones are probably due the sandy plains which cover vast tracts in North Mexico, stretching thence far into New Mexico and Texas. Here the Bolson de Mapimi, a vast rocky wilderness inhabited until recently by wild tribes, occupies a space of perhaps 50,000 square miles in Coahuila and parts of the surrounding States.

None of the horizontal layers seem to be very rich in ores, which are mainly found in the metamorphic, palæozoic, and hypogene rocks of Durango, Chihuahua, and the south. Apart from Sinaloa and Sonora, which are now known to contain vast stores of the precious metals, nearly all the historical mines lie on the south central plateau at elevations of from 5500 to 9500 feet. A line drawn from the capital to Guanajuato, and thence northwards to the mining town of Guadalupe

y Calvo of Chihuahua, and southwards to Oaxaca, thus cutting the main axis of upheaval at an angle of 45° , will intersect probably the richest known argentiferous region in the whole world.

Of other minerals the most important are copper, found in a pure state near the city of Guanajuato, and associated with gold in Chihuahua, Sonora, Guerrero, Jalisco, Michoacan, and elsewhere; iron in immense masses in Michoacan and Jalisco, and in Durango, where the Cerro del Mercado is a solid mountain of magnetic iron ore; lead associated with silver, chiefly in Oaxaca; tin in Michoacan and Jalisco; sulphur in many craters; platinum, recently found in Hidalgo; cinabar, also recently found in Morelos and Guerrero; "steppe salt" in the sandy districts of the north; "bitter salt" at Tepeyac and many other places; coal at various points; bismuth in many parts; marble, alabaster, gypsum, and rock-salt in great abundance throughout the plateaus and the sierras.

MINING.

Mexico is, perhaps, the richest mining country in the world, and the production of silver—notwithstanding the imperfect methods and other drawbacks with which it has contended—represents over one-third of the product of the world, according to official statistics. Almost all the mountains of Mexico are of the metalliferous character, but those which seem richest in mining deposits are the western cordillera, extending from the State of Oaxaca to Sonora, a distance of about 1600 miles from northwest to southeast.

Humboldt gave as his opinion that Mexico would be "the treasure-house of the world." Subsequent history has, in a great measure, confirmed the opinion of the great savant of his time. Still a more conservative authority has quite lately asserted that only one-tenth of the mining resources of Mexico is known. This last estimate, I am sure, is inside rather than outside of the facts. Mexico has always been considered the great silver producer, and, considering her area, and taking the century as a measure, she is the greatest silver producer of the world.

Silver.—The central group of mines in the three mining districts of Guanajuato, Zacatecas, and Catorce, in the States of Guanajuato, Zacatecas and San Luis Potosi, which have yielded more than half of all the silver heretofore found in Mexico, lies between 21° and $24^\circ 30' N.$, within an area of about 13,000 square miles. Here the Veta Madre lode of Guanajuato alone produced \$252,000,000 between 1556 and 1803.

In the beginning of this century Humboldt found two Guanajuato mines—the famous "Conde de Valenciana" and the "Marques de Rayas"—producing annually 550,000 marks, 4,400,000 ounces, of silver,

one-seventh or one-eighth of the entire American output. From January 1, 1787, to June 11, 1791, the Valenciana yielded 13,896,416 ounces of silver, its ore averaging a little over 100 ounces to the ton. Though flooded, this fine old mine is still far from exhausted.

Gold occurs chiefly, not on the plateau in association with silver, but on the slopes facing the Pacific, and apparently in greatest abundance in Sonora, near the auriferous region of Lower California. The production would have been larger if an improved process of reducing the metals had been used, but during the whole colonial period and up to the present time, we have used the patio system, which consists in grinding the ore, stirring it until it is reduced to a fine dust and mixing it then with salt and copper amalgam; after the paste dries somewhat, salt is added in proportion to the amount of silver supposed to be in the ore; the material is then mixed with shovels and trodden by mules, and, after a day or two, another mixture of copper, vitriol, and salt is added; after that it is mixed and trodden again; then quicksilver is finally added, and then more mixing and treading. This process is repeated from five to fifteen times until the silver and quicksilver unite to form an amalgam, which is gathered into bags, and that requires about forty days. Most of the quicksilver is squeezed out and the rest is evaporated and run off into tubs. This method saves 50 or 60 per cent. of rich ore and, besides being very long, is rather imperfect, as it leaves a great deal of silver in the ore, and only rich ores could be treated by it; but it was on the whole the easiest and cheapest.

Some of the old mines were worked until finally they became so deep that, with the methods then used, as buckets were employed instead of pumps, and steam had not been employed as power, it was impossible to drain them. Naturally in a deep mine the water flows in from springs, and the deeper a mine becomes the more water it has. These mines were worked until it was seen that it was impossible to drain them, and then they were abandoned, even though they were rich in metals. During our war of independence almost all the mines were abandoned for the want of guarantee to life and property, and the mining industry, therefore, declined considerably; but recently the old mines have been worked again and the production of silver has increased very considerably.¹

¹ Mr. J. A. R. Waters of the firm of Waters Bros., Mining Engineers of the City of Mexico, said of his visit to the Jesus Maria District of the State of Chihuahua, where he went to examine the mine worked by the Pinos Altos Co., as follows:

"The district is very thoroughly mineralized and is pierced by veins more frequently than any district I ever saw. The general formation is very similar to that of Cripple Creek, with the exception that it is not traversed by the great porphyry dikes that occur there and in other parts of Colorado. The country formation is largely braccia. The ore is generally free milling, and is treated with stamps and pan amalgamation, the finer ores being treated with Huntington mills. There is little waste of values."

Real del Monte Company.—It would be interesting to refer briefly to the ups and downs of one of the mining enterprises of Mexico—the Real del Monte—as a typical case which exemplifies what has happened with many other of our mines, namely, that sometimes they yield large profits, and soon afterwards they cause tremendous losses. The Real del Monte is located about three miles from Pachuca, a large mining centre and the capital of the State of Hidalgo, distant about sixty miles southeast of the City of Mexico.

In 1739, a Biscayan, by the name of Don Pedro Jose Romero de Terreros, came from Santander and settled in Queretaro. He acquired a fortune of \$60,000 in a small store in 1749, closed up his affairs, and started to return to his native land. On reaching Pachuca he met an old mining friend, Don Jose Alejandro Bustamante, who called his attention to the Real del Monte. In company with Bustamante he staked out the Biscaina, Santa Brigida, and Guadalupe mines and began to get the water out, but they soon exhausted their united funds. However, they succeeded in raising money in the City of Mexico on hard terms and drained their properties by a tunnel, which started at Moran, on the northern slope of the mountains, and, running 9000 feet through hard porphyry rock, struck the vein at a depth of 600 feet. This was accomplished a few years later in 1759. Bustamante by this time had died, but Terreros continued the work. On striking the vein he drained it, and in 1760 began the erection of the Hacienda de Regla, to work the rich ore he was taking out. He took out \$15,000,000 at a small cost, repaid his advances, built and presented to the King of Spain a man-of-war and 4700 bars of silver, for which he was created Conde de Regla. He lived in grand style in the City of Mexico, and built a palatial residence on Cadena Street.

He died in 1781, and was succeeded by his son, the second Conde, who from 1774 to 1783 struggled with the water, which, as depth was attained, was very severe; according to Ward, twenty-eight horse-whims were employed in the drainage at great expense and unsuccessfully. However, they had gotten down to 324 feet below the Moran adit on the Biscaina vein in the Guadalupe and Santa Teresa shafts. The production was \$400,000 per year, drainage costing \$250,000 per year, and sinking was abandoned, and the work was confined to drifting above water level.

From 1801 to 1809, \$300,000 per year was taken out, but the cost of extraction was severe. Humboldt visited the property, and in 1810 the war of independence broke out, and all operations were suspended. Meanwhile the water rose and the Moran tunnel caved in, and so allowed the water to rise to an enormous height, and the district went to rack and ruin.

In 1822 the Conde's administrator, Don Ignacio Castelazo, made a

report, and by his Italian mining friend, Rivafinoli, sent it to the Conde, who was living in England.

That country was only too anxious to reap for themselves some of the spoils that Spain had gleaned from Mexican mines. Here was their opportunity, many became interested, and the celebrated mining expert of that day, Mr. John Taylor, the founder of the present London firm now so heavily interested in South Africa, Taylor Bros., was sent to make an examination, and in 1824 the English Real del Monte Company was formed on the following terms:—The company leased the mines and haciendas for twenty-one years: 1st. The capital invested was to be returned from the products of the mines with interest; 2d. The Conde was then to have one-half of the remaining proceeds yearly; 3d. Meanwhile he was to receive \$16,000 per year as an advance against his portion or anticipated profits. In case of failure of this third clause the lease would be cancelled and everything revert to the Conde. As the outlay amounted to over \$5,000,000 and no profit ensued, it amounted to a rent of \$16,000 per year.

In 1824 Captain Vetch, of the Royal Engineers, was sent out as manager. He brought three ships filled with one thousand tons of machinery, pumps, etc., and after untold trials in transportation and erection, finally got them to their destination. All this was done by English engineers, machinists, miners, and workmen, nearly all Cornishmen, under the direction of Colonel Colquhoun, a Peninsular veteran, who finally died of yellow fever with over fifty of his men. After unheard-of troubles they got everything by 1826 safely landed in the Real del Monte. The magnitude of the task may be understood when the almost roadless condition of the country is considered, and the bringing up of the machinery from the coast was a splendid example of British tenacity and pluck.

Captain Vetch had now cleaned out the Moran adit and the Dolores shaft, and the machinery was at once erected. The stock now rose from \$500 to \$8000 per share. The Conde had, in the meanwhile, borrowed money from the company and made the twenty-one-year lease perpetual, the annual rent of \$16,000 remaining in force.

By 1829 Captain Vetch had grappled with the water question, and with an annual cost of \$30,000 had accomplished what the first Count had paid \$250,000 for, and extracted metal 324 feet below the Moran adit.

Captain Tindall, R.N., succeeded Captain Vetch, and a new shaft (1830) was commenced on the Santa Teresa and called the Terreros shaft. It was 1140 feet to the vein and was started at four points, and was connected in 1834 by drifts run from several levels, and then raised and sunk on. The work came out as true as if it had been done from the surface, thanks to the correctness of the plans of the English mine surveyors.

A 54-inch engine was erected, and with it they sank to 720 feet below the Moran adit. At this point water overpowered them. This was in 1838, and Captain John Rule, who had succeeded Captain Tindall, put in a 75-inch engine at Dolores, and removed the 54-inch one to Acosta. Captain Rule enjoyed a salary of £10,000 per year, and all other payments were in proportion. He struck two bunches of rich ore, one on the Santa Brigida, near Acosta, and the other on La Biscains, near Dolores. From these two and one at Torrerros they had produced \$10,481,475 at a cost of \$15,381,633 or nearly \$5,000,000 loss in twenty-three years. By 1846 the stock had fallen to \$12.50 from \$8000 a share.

In 1848, Mr. J. H. Buchan arrived, representing the English stockholders. He found water in the mines and increasing; a heavy debt of \$5,000,000, bearing a tremendous interest; no money on hand and no ore. So in October, 1848, by order of the bondholders he turned over the business to a Mexican company—the present one—composed of Manuel Escandon, Antonio and Nicanor Beistegui, Mr. Mackintosh, and others for the paltry sum of \$130,000. The haciendas, stock, and ores on hand were worth millions, but the English company could not dispose of them.

This was the end of the famous English Real del Monte Company. Their Mexican successors reduced expenses, completed the adit from Omotitlan commenced by the first Conde, which, running 13,500 feet, cut the mines 1110 deeper and struck immediately the *bonanza* in the Rosario, which tradition says had previously been discovered and covered up by Captain Rule.

New Mines, Topia.—We have now a great many districts that were not known by the Spaniards and have recently been discovered. Notable among them is the Sierra Mojada district in the State of Coahuila. The State of Durango has, on the west slope of the Sierra Madre mountains, the mining camps of Topia, Sianori, Birimoa, Gusanillas, Canelas, Ventanos, El Pando, Rodeo, and San Fernando; and with the exception of San Fernando they are close together, a square, one of whose sides is forty miles, would almost cover them all. This section has all the elements to form the basis of a great mining and smelting centre, as is evident by the great deposits of galena in the Topia district; in fact, this is the only place on the coast where lead ore is found in abundance; and smelting, if done at all, must rely on Topia for its supply of lead ores. In no other part of Mexico are lead ores so cheap, because of the fact that to realize on them at all they must be transported on mule-back to Culiacan in the State of Sinaloa, a distance of 106 miles, at a rate of \$26.40 silver per ton, and from there by rail to Altata, a distance of thirty-nine miles; and from Altata by steamer to San Francisco, or to Guaymas, and thence by rail to the

smelters in the United States, very much at the same cost. La Liona mine of this district is a very rich mine, its vein being almost vertical, and is tapped from both sides of the mountain, with tunnels at right angles to the vein. Where the tunnels intersect the vein, the vein is driven on in both directions from the tunnels; stopes are opened, and chutes for ore are put in every seventy-five feet. The vertical distance between the tunnels is 125 metres. This mine can easily produce one thousand tons per month of clean galena, and would produce that much metal if there was a market for it.

There are other mines as large and perhaps better than La Liona, as, for instance, La Madrugada mine, formerly owned by Santa Fé Railroad employees, but now controlled by Mr. Charles Miller, of Franklin, Pa., connected with the Standard Oil Company. Topia is a great dry-ore camp as well. One thousand tons of dry ores can easily be mined there per month, were there a market for them, such as a commercial smelter located centrally to treat the ores of this and adjoining districts. Such smelter would have the advantage of an inexhaustible supply of good water the year round, fine iron ore, and limestone for fluxes.

At Topia there are four mills for the treatment of zincy ores, and dry ores assaying below one hundred ounces silver per ton. The lixiviation process by hyposulphite of soda is employed in the four mills or haciendas, two of them employ occasionally the patio process as well. Two of the mills and two mines are lighted by electricity; the dynamo that furnishes light for one of the mills and both of the mines is driven by water power. Below the mills operated by water power, there is sufficient fall and sufficient water to furnish the power to operate compressed-air drills in all the large mines.

The other mining camps of this district, although not so well developed as Topia, are also in process of development and in a very good condition. Velardeña is also in the State of Durango, but on the other or eastern side of the mountains, and is located in a comparatively new district, where the previous owners had failed. Mr. James F. Mathews purchased the Velardeña property, erected a smelter after the International Railroad Company had extended their main line from Torreon to the city of Durango, passing near the mine, and from the beginning has run five of the six furnaces almost continuously. During 1896 the Velardeña smelter smelted on an average 175 tons of ore per day.

Li Hung Chang and the Mexican Silver Mines.—When Li Hung Chang, the Chinese Viceroy, was in Washington, in August, 1896, he inquired of me about the production of the Mexican mines, and I, trying to be conservative, informed him that they produced about \$50,000,000 a year. He then inquired how long they would continue yielding that amount. I answered that it was uncertain, but that, judging from present appearances, it could safely be said that it might be for one

hundred years. This seemed incredible to him, and he said that I had been so long absent from Mexico—for he had previously asked me how long I had been in this country—I could not know the real wealth and abundance of our mines, and he was very positive that I had made a mistake. He assured me that the silver mines in China yielded occasionally something, but soon were exhausted, and it was impossible to get any silver out of them, and judging the Mexican silver mines from those he had seen at home, he was, of course, incredulous as to their yield.

Some years ago, and when the Mexican mines only yielded about \$20,000,000 a year, I predicted that their annual yield would reach \$100,000,000, and that prediction is about being verified, as the present product exceeds \$60,000,000.

Gold.—Gold was used freely in Mexico before the Spanish conquest, and history teaches us how Cortez induced Montezuma to deliver to him his gold treasury.

As soon as Mexico was conquered, Bernal Diaz del Castillo, one of the cotemporary historians, tells us that Cortez inquired very carefully about the place where the Indians obtained their gold, whether there were placers, mines, or washings, and his agents were taken to some localities in the State of Oaxaca, where they were told was the gold supply, but, whether the Indians concealed the real location of the gold deposits, or for other reasons, the Spaniards did not obtain much gold. I have known recently of unavailing efforts having been made of persons from the United States who have tried to ascertain the localities where the Indians obtained their gold, that is—the places which were shown to Cortez in Oaxaca as gold deposits.

There is a river in the State of Guerrero which flows over a country with hills abundant in gold formation, which carries nuggets that the natives find without any difficulty, and it is called for that reason the Gold River. That river passes over some mountains where gold is found, and then comes to a place where a natural dam is formed, and the gold carried by the washings in the rainy season sinks when reaching that place, and every indication shows that there must be a very large deposit of gold there. A military engineer suggested, the last time I was Secretary of the Treasury in Mexico, that the bed of the river be changed by the Mexican Government, a work which did not present serious obstacles, and thus allow excavations to be made and the gold deposits found. It was thought advisable to make some preliminary examinations in the way of boring, and for that purpose the necessary orders were issued to send soldiers there, but I understand the project was given up and nothing was accomplished. I have no doubt that at some future time that matter will be taken up, and a great deal of gold will be found there.

Our production of gold has so far been comparatively small, because the mining and reduction of gold are more difficult and expensive than the same operations in silver, and our gold production has really been the amount of gold which has been found in our silver. For many years, when the amount was small, it was not separated, and for that reason old Mexican dollars have in China greater value than newly coined ones; but recent improvements have made it easy and cheap to make the separation of the two metals. Now that gold has risen so much in value, its mining is beginning to be developed in Mexico on a comparatively large scale, and I have no doubt that before long Mexico will be one of the largest gold producers of the world.

Mexico is an undeveloped country, in fact there are parts of Mexico as unknown as was Central Africa a few years back. From the Sonora gold district, south, on the west side of the Sierra Madre, to the State of Oaxaca, there is a gold belt as rich as California, Alaska, and South Africa combined. It is known that in the State of Sinaloa there are gold placers and gold washings, and that they are also found in every State from there south on the line of this belt.¹

The gold output of Sonora, now beginning to attract attention, is only the first contribution of Mexico to the world's stock of the yellow metal. The west side of the Sierra Madre has a belt rich in gold, and when the world discovers this fact capital will flock to Mexico to dig it out, and Mexico will become one of the first gold producers of the world, as she has been in silver.

Specimens of "float" rich in gold have been brought from the State of Guerrero. These indications of gold have not been followed up, because no one has been progressive enough to advance the means necessary to prospect this belt. To prospect in a country where often water fit to drink must be carried, where food for man and beast must be carried, and where in many places roads must be cut with machete and axe, cannot be done without the spending of money in outfit and expenses.

The principal gold-producing States will be Sonora, Sinaloa, Guerrero, and Oaxaca, but in all of them gold-mining is yet in its beginning.

¹ I take from a report of Mr. Cramer, a mining engineer sent to Mexico by the Geological Society of Washington, D. C., as Commissioner to explore the gold fields of that Republic, the following, which refers to only one of the many new gold fields that are being found there :

"There exists an extensive 'gold placer' situated about thirty miles from Durango in the mountain devoid of vegetation; the rock that is found in greater quantities is porphyry. I estimate that one ton of ore will yield at least \$50 of gold.

"Gold is found all over the mountain, though in such imperceptible filaments that it is hard to recognize it with the naked eye; however, every piece of stone contains the same proportion of gold."

Coinage of the Precious Metals.—Mexico has produced about one-half of the silver supply of the world. In the statistical portion of this paper I shall give full details of the production of gold and silver in Mexico, coinage, etc., and here I will only append the total coinage of gold and silver according to official statistics of the Mexican Government, which is the following :

COINAGE OF MEXICO FROM THE ESTABLISHMENT OF THE MINTS IN
1537 TO THE END OF THE FISCAL YEAR OF 1896.

COLONIAL EPOCH.	GOLD.	SILVER.	COPPER.	TOTAL.
Unmilled coin from 1537 to 1731.....	\$ 8,497,950	\$ 752,067,456	\$ 200,000	\$ 760,765,406
Pillar coin 1732 to 1771.....	19,889,014	441,629,211	.....	461,518,225
Bust coin 1772 to 1821.....	40,391,447	888,563,989	342,893	929,298,329
INDEPENDENCE.	\$68,778,411	\$2,082,860,656	542,893	\$2,151,581,960
Iturbide's Imperial Bust, from 1822 to 1823.....	\$ 557,392	18,575,569	.....	19,132,961
Republic Eagle—1824 to 30 June, 1873.....	45,040,628	740,246,485	\$5,235,177	790,522,290
REPUBLIC.	\$45,598,020	758,822,054	\$5,235,177	809,655,251
Eagle coin, from 1 July, 1873, to 30 June, 1896.....	\$11,561,080	557,581,690	203,296	569,346,066

SUMMARY.

Colonial Epoch.....1537 to 1821.....	\$2,151,581,960
Independence.....1822 to 1873.....	809,655,251
Republic.....1873 to 1896.....	569,346,066
Total.....	\$3,530,583,277

Iron.—Iron, the most useful of all the metals, is found in such vast abundance in Mexico that, could it be even partially utilized, that Republic would become one of the wealthiest of modern communities. One of the largest mines was discovered by Gines Vazquez del Mercado, in Durango, in 1562, and its appellation of "*Cerro del Mercado*" still preserves his name. The hill, which is 4800 feet long by 1100 feet in width and 640 feet in height, is almost a solid mass of mineral, averaging about seventy per cent. of metal and from which could be extracted more than 300,000,000 tons of solid ore ; this only to the level of the plain, beneath which it probably extends to an unknown depth.

The iron is also magnetic to a high degree and its power is greater when the grain is fine. This may delay fusion, but the result is an excellent wrought iron, with none of the inconveniences caused by earthy substances mixed with the iron. I have no doubt that when the coal mines are developed the iron industry will make great strides and that we will be able to manufacture most of at least the low grades of the iron goods required for our consumption. In several other places besides our Iron Mountain we have iron with very little phosphorus, which makes first-class steel and is as good as the best produced in Cuba or Spain.

The deposits of iron in Mexico are sufficient to supply the universe for centuries to come. There is but one thing lacking, and that thing is—cheap fuel. Nature never works by halves; those immense deposits of iron never were put where they are without the means near at hand for their utilization. Coal exists, but it has not been mined yet on a large scale, as it will be hereafter.

But even at the present time the principal supply of pig-iron comes from native ore, the output being consumed by the producers in the manufacture of iron goods. The main iron mines now being worked are located at Durango, Zimapán, Zacualtipán, Tulancingo, and Leon. For the most part these mines are found in the midst of great forests, in consequence of which cheap fuel is found in the form of charcoal, the iron made from which being of very superior quality, free from phosphorous, and, price and other things being equal, is always preferred to the imported pig. It is manufactured in charcoal furnaces exclusively.

There is, however, quite a considerable amount of pig imported, principally from Alabama, and Scotch pig from England. The great drawback to importations heretofore has been the immense quantity of scrap iron, which, during the lapse of centuries, had accumulated, unused, throughout the Republic. This, however, is becoming well-nigh exhausted; and for that reason the demand for imported pig is increasing, the native output not keeping pace with the need for it. Much scrap iron also has come from railroads, another source of supply which is not increasing with the demand.

Imported pig ranges in price in the City of Mexico from \$50 to \$60 silver per ton, the native producers aiming to keep their price just about the same.

Iron Foundries.—There are in the City of Mexico, in addition to several small ones, seven large foundries, as follows: the Mexican Central Railroad foundry, the Mexican National Railroad foundry, the Artistic, the Delicias, Charreton Bros., V. Elcoro & Co., and Hipolito David. There are also large foundries at Pachuca, Puebla, Chihuahua, Durango, and Monterey, as well as smaller ones at Irapuato, Guanajuato, Zacatecas, Veracruz, Guadalajara, Mazatlán, Oaxaca, and Morelia.

Copper.—Copper is now quite an important product of Mexico, and is used to a certain extent in the country, but as the supply far exceeds the home demand, it is exported to the United States and Europe. That which finds its way to this country enters chiefly in the form of matte, and is refined into casting or electrolytic copper. What goes to Europe is blister copper, or approximately so, from the Boleo mine in Lower California, where a French company is working a large group of copper mines. The point of most activity is Santa Rosalia, on the

Gulf of California, where the company treats the ore in its own smelting plant adjoining. The matte, or black copper, is sent to Europe in the same vessels that bring out coke. The company gives employment to thousands of hands directly and indirectly, owns its own steamers, and solicits workmen all along the coast. But this enterprise, large as it is, shows the progress that has been made and the difficulties overcome by individuals. The country itself is arid and sterile, and there is little encouragement for others to prospect, or even develop, when found, apparently good prospects, owing to the natural difficulties to be overcome and the vast capital necessary to successfully carry on mining operations; as success is hardly to be obtained except by treating the ores on the ground, as the Boleo Company has done.

At the same time the enterprising firm of Guggenheim has established its works at Aguas Calientes, adding very considerably to the copper product, and the increase of matte shipments from San Luis Potosi and Monterey makes a large difference from former returns. To judge from the official figures, the amount of copper produced in 1896 was not less than 22,000 metric tons, the greater production being from the Boleo mines.

Quicksilver.—The production of quicksilver can only be approximated from imports, as the native production is far short of the requirements of the country. In 1895 the amount imported was 818,704 kilos, with a value of \$541,664, while during the past year the amount imported was 854,526 kilos, with a value of \$574,153. The only inference to be drawn from these figures is that the production in Mexico in the past year as compared with 1895 has not increased, and the figures of production given in the *Engineering and Mining Journal* of 1895 may be accepted as correct for 1896.

Coal.—Fuel is perhaps the greatest and most pressing need of Mexico. For centuries the population of the whole country has used wood for fuel, until the most thickly inhabited portions of the country are completely destitute of trees. This condition of things is a very serious objection to the increase of manufacturing, as it is impossible to manufacture cheaply when fuel commands a very high figure. Coal, which has to be transported sometimes for thousands of miles before it reaches the centre of the country, becomes very expensive. At present rates the cost of wood in the City of Mexico is equal to \$14 a cord, while coal ranges from \$16 to \$22 per ton according to grade, and one source of supply is the artificial fuel of compressed coal dust brought from England, and in use not alone on the Veracruz Railway, but in various local industries, while coal also comes from West Virginia, Alabama, etc. The distances of the sources of coal supply and its consequent cost led to the attempt of utilizing the peat deposits which

are of great extent and practically inexhaustible within ten miles of the City of Mexico.

In the Tlahualilo district of the State of Coahuila, for instance, owing to the distance from the nearest coal mines, the question of fuel is very important, as there are at present more than three hundred horse-power in constant use, and the amount is steadily increasing. The main supply is from the mesquite brush, which is cleared from the new lands as the work of ditching and preparation advances. The hulls of the cotton seed also make a hot but quick fuel for some of the larger stationary engines. The wheat, straw and cotton bushes are utilized for brick-burning and for the domestic purposes of the laboring population.

Those acquainted with industrial conditions in Mexico and making investigations with a view to the establishment of new industries in that Republic, are consequently impressed with the fact that, in spite of the cheap labor, favorable climatic conditions, and good home markets, the lack of cheap fuel is exceedingly detrimental to a large proportion of the industries of this country; but fortunately large deposits of coal are now being discovered in the Republic. At Salinas, in the State of Coahuila, a large bed of coal is being worked by the International Railroad Company, which furnishes fuel for that road and even for a portion of the Southern Pacific Railroad and for some of the manufactories in Monterey. In the district of Tlaxiaco, in the State of Oaxaca, a very rich coal-field has been discovered, but for the present it is inaccessible and before a railroad can be built to tap it it cannot be used, as the expense of transportation would be exceedingly high. Sonora contains a carboniferous area, several miles in extent, with innumerable veins from five to sixteen feet in thickness, of hard, clean, anthracite coal, carrying as high a percentage in fixed carbon as the best coal mined in Wales. The ledge is thirty miles in length and averages sixteen feet in width, showing a quantity sufficient to supply the entire Pacific coast with anthracite coal of the first quality for years to come. The configuration of that State and the proximity of the sea make it comparatively easy to work it.

At Jiquilpan, State of Michoacan, almost immediately south from Negrete station on the Guadalajara branch of the Mexican Central Railroad, a large coal-field has been discovered. While it is not probable that either anthracite or first-class bituminous coal will be found in these fields, still the great value of even an ordinary class of coal will be appreciated by those acquainted with industrial conditions in Mexico. The coal measures of the Chapala district probably belong to the tertiary period, and lie in stratified rock overlaid by an outflow of basalt or lava, at an elevation of 250 or 300 feet above Lake Chapala. The general series of rocks has been examined and pronounced

as coal-bearing by an eminent geologist. The measures are quite extensive, being easily traced from Yurecuaro to near Ameca with occasional interruptions through volcanic intrusion. The developments already made, show that the coal or lignite veins extend over perhaps thirty square miles. How much beyond these limits, it would be impossible to state. It exists in considerable quantities. There are a number of veins overlying each other, and varying from two inches to fifty inches in width ; but, as the explorations have not yet found the veins in place, it is impossible to say exactly what their condition will be. A feature which adds considerably to the value of these deposits is an extensive deposit of bog iron in the immediate vicinity. If further exploration discovers considerable quantities of commercially valuable coal, it is easy to estimate the results to the industries. Other beds of coal have been discovered but of less consequence, and in several of the northern states of Mexico there are known to exist large deposits.

Mexican industries will be completely revolutionized when they can use cheap coal instead of wood for all purposes, thus cheapening the cost of manufacturing by using cheaper fuel, which is so important an item of expense in manufacturing.

Mexican Miners.—While the laborers employed in Mexico will not compare in efficiency with the labor of the miner in the United States, it must be borne in mind that the American miner works eight hours and receives \$3 per day, or \$6 in Mexican money, and \$6 in Mexican money will employ from eight to twelve Mexicans, wages varying from 50c. to 75c. per day. As for the climatic conditions, it is only necessary to say that in all the mining districts of Mexico a miner can work 365 days in the year. There is never any snow or cold weather in winter, and the heat in the summer is not so extreme as in St. Louis, Chicago, or New York, and never enervating. A pair of blankets at night are indispensable every night in the year.

Mining Laws.—The mining laws of Mexico issued during the Spanish rule, which were kept in force until 1884, were both liberal and wise, and were intended to encourage mining. The domain of the mines remained in the Government and it gave temporary titles to anybody who discovered one, and who was willing to work it, but only as long as work was done in the mine. When the discoverer or owner could not for any reason continue to work it, and allowed a certain time to elapse without doing any work, the mine reverted to the Government and anybody else willing to work it could obtain a temporary title over it. This system was changed, by our Mining Code of 1884, to the effect of giving the mines in fee simple to the discoverers of the same, whether they were worked or not by those who denounced them, and the only cause for forfeiting the title is the failure to pay a

tax of \$10 per pertenencia, a "pertenencia" being our unit of a mining property and consisting of a hectare or a square 100 metres on each side, equivalent to 2.47 acres. The rights of the owner of the land are not interfered with, and in case anybody discovers a mine upon another man's property, the landlord continues to own the surface, and all the discoverer is entitled to is the mineral underground and so much of the surface as is necessary to work it, for buildings and other mining requirements, and for that the owner of the ground is compensated by agreement, or, if no amicable agreement can be reached, by arbitration.

Mining litigation is quite rare in Mexico, and it does not take long to get a final decision, as mining cases are tried before a single judge, and appeals lie to the Supreme Courts of the different states, and to the Federal Supreme Court in Mexico. To the honor of the courts in Mexico be it said, as may also be said of the judiciary in the States and the United States Federal Courts, they are above reproach.

A concise statement of the provisions of the present mining laws of Mexico will not be out of place here.

The law grants to all inhabitants of the country the right to acquire and work mines. He has to denounce a new mine. A denouncement means making a location. When the location of a claim has been determined upon, all possible data are obtained concerning it before the denouncement is made. It may be a rich old mine, and yet if the law has not been complied with it is subject to relocation. The law grants to any inhabitant of the Republic the right to explore for mineral. All districts have their mining agents and all the prospector has to do is to have the regular form of petition used in making out a denouncement, as it is called, made out and submitted to the mining agent of the district. If there does not happen to be a mining agent in the district, the petition is presented to the local postmaster. The expense of registering the petition is \$1. After registering the petition, the mining agent has thirty days in which to appoint an expert to examine the property, who has eight days in which to reply to the summons, and if he accepts the service, the mining agent issues in duplicate a document stating that the claim has been denounced and directing objecting parties to make known their prior claims within a period of four months from the date of the denouncement, or forfeit any right to the property.

The charge of the expert for making a report upon the claim, together with the plans, is about \$15 per claim and travelling expenses. The expert has sixty days in which to send in his plans and report. The notification that the property has been denounced is published in the official journal of the district, the cost of which varies in the different states, from \$2 to \$4 being the usual fee.

The cost of making up a mining title is from \$10 to \$12. Titles, when once granted, unless fraud is shown, are irrevocable so long as the taxes are paid, which are ten dollars per year on each "pertenencia," and no work or manual labor is necessary to hold the same. The taxes may be paid quarterly or annually, at the discretion of the holder, to the mining agent of the district in which the property is denounced, or by special arrangement they may be paid at the office of the Federal Treasury in the City of Mexico. After the title is granted, it must be registered in the district where the denouncement is made, and also entered upon the books of the stamp office, for which no fees are charged.

MINTS AND DUTIES ON SILVER.

Under the Spanish laws all silver paid a duty ; and as most of it was coined, that duty was levied on coinage, and the exportation of bullion was prohibited ; but of course a great deal was smuggled, both during the Spanish rule and still more when Mexico was opened to foreign trade after our Independence. When I occupied for the first time the Treasury Department of Mexico in 1868, it seemed to me an outrage against the mining industry of the country to require the miners—especially those who were far removed from the mints—to take their bullion from the mints, at a heavy expense and risk, coin it there and take it back to the mines, and from there to the ports to be exported to London, where it was often again turned into bullion ; and as the contracts made with the lessees of the mints did not allow the free exportation of bullion, I proposed and succeeded in having enacted a law for the purpose of allowing bullion to be exported, provided that it paid the coinage duty at the respective custom-houses for the benefit of the mint's lessees ; and this condition of things, extraordinary as it may seem, was a great relief to the silver producers, and continued until the Mexican Government could recover all the mints and be free to legislate on the subject, which it was able to do partially during my last incumbency of the Treasury Department ; they all since having been recovered.

We had thirteen mints in the country to coin the silver extracted from our mines, which, in the precarious condition of the Mexican Treasury, were sometimes rented to private parties who advanced a sum that seemed large at that time, although it was a trifle in comparison to their profits, as they collected a duty of nearly $4\frac{1}{2}$ per cent. upon the amount of bullion coined, and they credited to the Government only $1\frac{1}{2}$ per cent. of the same, the laws requiring that only coined silver could be exported. But now that silver can be transported easily from the mine to the mint, since a railway system has been built, the mints have been reduced to four,—one in the City of Mexico, which

is the principal one ; one at each of the cities of Guanajuato, Zacatecas, and Culiacan, the last being the capital of Sinaloa.

Besides the mint or coinage duties, silver was taxed in Mexico with an export duty which sometimes was as high as twelve per cent. on the value of the silver, which, together with the mint duty, amounted to seventeen per cent., not taking into account other taxes and local duties. Only the rich character of the Mexican mines could stand that burden.

The duties on silver have been readjusted and reduced considerably, until now they only amount, as established by the law of March 27, 1897, to a coinage duty of two per cent. and a stamp duty of three per cent., which are paid at the Assay Office of the Mint when coined, or at the custom-house when exported in bullion, ores, or other compounds. When exported in ores in their crude condition, the duty has a rebate of ten per cent. A small duty representing the cost of the operation is also charged for assaying, refining, smelting, and separating the metals.

SMELTING PLANTS.

The Tariff Act of October 1, 1890, having levied a duty upon lead ore, which prevented that Mexican product from coming into the United States in the shape it had come before, the American companies, who had been developing the lead ore in Mexico, established smelting plants in the country for the purpose of treating there the lead ore, and sending it as pig-lead to the United States.

The smelting plants that have been established in Mexico, and their capacity and output, taken from official data received from the Mexican Government, up to December 31, 1896, are the following :

Mexican Metallurgical Company.—This company, of which Mr. Robert S. Towne is president, obtained a charter from the Mexican Government on March 20, 1890, to establish five smelting plants in Mexico, two with the minimum capacity of 200 tons a day, two of 150 tons, and one of 100 tons. The first one is located at Morales, five kilometres west of the city of San Luis Potosi. During the fiscal year 1895 to 1896, this plant received 62,370 and 020/1000 metric tons of ore from the States of Chihuahua, Coahuila, Durango, Guanajuato, Jalisco, Mexico, Michoacan, Nuevo Leon, Queretaro, San Luis Potosi, and Zacatecas. This plant yielded during the same year 16,019 and 070/1000 metric tons of base lead bullion, with 3,198,924.14 troy ounces of silver, valued at \$4,882,177.50 ; and 8268 and 37/100 troy ounces of gold, valued at \$161,338.63.

National Mexican Smelter at Monterey.—This company, whose president is Mr. Daniel Guggenheim, obtained a charter from the Mexican Government on October 9, 1890, to establish three smelting plants in Mexico, two with a minimum capacity of 300 tons per day,

and one with 100 tons. The first plant is located in the outskirts of the city of Monterey, has ten furnaces of the water-jacket system, and seven smelting furnaces for lead ore. From July, 1892, to June, 1896, this plant has smelted 521,809 and 769/1000 metric tons of ore, yielding 78,067 and 141/1000 tons of lead, with 515,382 kilograms of silver, with a value of \$21,824,597.93, having used foreign coke to the value of \$1,474,385.81, and Mexican coke to the value of \$73,268.08.

Central Mexican Smelter.—The second smelter of the Guggenheim Company is located at Aguascalientes. It has a department for concentrating copper ores, one for smelting the same ores, consisting of three furnaces, and another with four furnaces for smelting lead ores. This plant smelted from the 26th of December, 1895, 606 and 190/1000 tons of lead, containing 6502 kilograms of silver and 28 and 71/100 kilograms of gold, with a value of \$341,091.

Velardeña Mining Company.—This company, whose president is Mr. Edward W. Nash, obtained a charter from the Mexican Government on May 15, 1893, for the construction of two smelting plants in Mexico, with a capacity of 200 tons a day each. From November 30, 1893, to June 30, 1896, this plant smelted 110,000 tons of ore, yielding 9069 and 680/1000 tons of lead containing 1,850,685 troy ounces of silver and 6192 ounces of gold.

The Chihuahua Mining Company.—This company, whose president is Mr. John B. Shaw, obtained a charter from the Mexican Government May 26, 1893, and is located near the city of Chihuahua. Up to July 28, 1896, it had smelted 28,555 tons of lead ore, yielding 3761 tons of lead and 529,450 troy ounces of silver.

The Mazapil Copper Company, Limited.—This company established a plant at Concepcion del Oro, Zacatecas, and has smelted 5000 tons of lead ore containing silver.

Sabinal Mining and Smelting Company, Chihuahua.—This company owns the mines of Santa Juliana and Santa Inez, which yield 30 per cent. of lead, with a mixture of silver, and smelts their ore, notwithstanding that the cost of a ton of coke amounts to \$37.50.

La Preciosa.—A smelter under that name has been established at Tepeyahualco, State of Puebla, but I do not have any data about the company owning it, and the date of its contract with the Mexican Government, nor the amount of ore smelted there.

The Boleo Smelter.—I have already spoken of this plant, which smelts copper ores at Santa Rosalia, Lower California.

OROGRAPHY.

Mexico is traversed by two cordilleras or high ranges of mountains running almost parallel to the coast, one along the Gulf of Mexico and the other along the Pacific Ocean. The former runs from ten to

one hundred miles from the coast, leaving an imperceptibly inclined plane from the sea to the foot of the mountains; while the cordillera on the Pacific side runs, on the whole, very near the coast, leaving a very narrow strip of land between the same and the sea, and from this run several branches in different directions. The most continuous range is the Sierra Madre of the Pacific, which may be traced, at a mean elevation of over 10,000 feet, from Oaxaca to Arizona. Parallel to this is the Lower Californian range (Sierra de la Giganta) 3000 feet, which, however, falls abruptly eastwards, like the Atlantic escarpments. The California peninsula seems to have been detached from the mainland when the general upheaval took place which produced the vast chasm now flooded by the Gulf of California. Corresponding with the Sierra Madre on the west are the more interrupted eastern scarps of the central plateau, which sweep around the Gulf of Mexico as the Sierra Madres of Nuevo Leon and Tamaulipas at an elevation of about 6000 feet. These are crossed by the routes from Tula to Tampico, the highest pass being 4820 feet; from Saltillo to Monterey 3400, and at several other places.

Of the central cross ridges the most important orographically and historically is the Cordillera de Anahuac, which surrounds the Mexican (Tenochtitlan) and Puebla valleys, and which is supposed to culminate with Popocatepetl and Ixtacihuatl. But these giants belong to a different or rather more recent system of igneous upheaval, running from sea to sea between $18^{\circ} 59'$ and $19^{\circ} 12' N.$ in almost a straight line east and west, consequently nearly at right angles to the main axis of the central plateau. The line is clearly marked by several extinct cones and by five active or quiescent volcanoes, of which the highest is Popocatepetl, lying south of the capital, nearly midway between the Pacific and the Atlantic. East of the central point of the system are Citlaltepētēl, better known as the peak of Orizaba, on the coast south of Veracruz, to which correspond on the west the recently upheaved Jorullo in Michoacan, Colima (12,800) near the coast in Jalisco, and the volcanic Revillagigedo group in the Pacific. South of this line and nearly parallel, are the sierras of Guerrero, and south-east of the Tehuantepec Isthmus those of Oaxaca and Chiapas towards the Guatemala frontier. In the same direction run the islands of Cuba and Hayti, which probably belong to the same Central American system.

In the course of centuries these high mountains have become disintegrated by the rains and other natural elements, and a great many spaces between them filled up, forming a series of valleys and other spots quite delightful in climate and very rich in agricultural resources. This series of valleys, which we call the central plateau, runs from about one hundred and fifty miles east of the City of Mexico, traversing all of Mexico in a northwesterly direction. So level is the plateau

that even when there were no wagon roads in Mexico one could travel in a carriage from the City of Mexico to Santa Fé. Baron Humboldt and other geologists considered the cordilleras of Mexico as a portion of the Andes of South America, which originate in Patagonia, extending over the whole of that continent; but researches were made specially by a corps of engineers, who surveyed Mexico during the French Intervention, arrived at a different conclusion, and consider that the Andes proper end in Panama, and that the Mexican cordilleras are entirely independent from that lofty chain of mountains.

In contrast with the plains and at times barren districts of the central plateau, it is occasionally broken by depressions of the soil, known as barrancas, descending sometimes one thousand feet and measuring several miles across, which are covered with a luxuriant vegetation of trees and shrubs, and watered by small streams running through the middle of the valley. Among the most remarkable ones are the barranca de Beltran descending the western slope from Guadalajara to Colima, and the barranca de Mochitilte from Guadalajara to Tepic.

One of the pre-eminently interesting features of Mexico is the mountain of Jerullo, in this section, which has been born within recent times. The natives described to Alexander von Humboldt the convulsions of the earth during its birth, and the frightful spectacle of the huge mass thrusting its giant shoulders among its neighbors, making room for itself in their ranks.

The best way to illustrate the broken surface of Mexico is to give the altitudes of some of the principal localities, both from the coast to the interior and from the interior back to the coast, taken from the measurements made by the railroad companies and by the engineers of the Mexican Government in the national wagon roads where railroads are not yet running. I append to this paper a list of such altitudes, with their distances, whenever I have been able to find them, which I consider the best illustration that could be presented on this subject.

MOUNTAINS.	STATES.	ELEVATION IN FEET.
Popocatepetl.....	Mexico.....	17,540
Orizaba.....	Veracruz and Puebla.....	17,362
Toluca.....	Mexico.....	15,019
Ixtacihuatl.....	Mexico and Puebla.....	16,076
Colima.....	Jalisco.....	14,363
Zapotlan.....	Jalisco.....	12,743
San Martin or Tuxtla.....	Veracruz.....	4,921
Tancitaro.....	Michoacan.....	12,467
Jorullo.....	Michoacan.....	4,265
Tacana or Soconusco.....	Chiapas.....	7,436
Guarda.....	Federal District.....	9,731
Ajusco.....	Federal District.....	13,628
Cofre de Perote.....	Veracruz.....	13,415
Zempoaltepec.....	Oaxaca.....	11,141
Pico de Quinceo.....	Michoacan.....	10,905
Veta Grande.....	Zacatecas.....	9,140

The above are the principal mountain peaks of Mexico, the first ten being volcanoes, with their heights according to the most recent measurements :

HYDROGRAPHY.

The eastern Mexican coast, washed by the Caribbean Sea and the Gulf of Mexico, is low, flat, and sandy, except near the mouth of the Tabasco River, where at some distance from the coast appear the heights of San Gabriel, extending northeast and southwest for several miles ; but the majestic mountains of Veracruz, especially the volcano of Orizaba, visible for many leagues to seaward, form a picturesque background which relieves the monotony of the shore region of that State. On the Pacific side the coast, although generally low, is here and there roughened by spurs extending from the cordillera to the ocean.

The principal gulfs are those of Mexico, California, and Tehuantepec, the first of which ranks among the largest in the world.

We are not blessed with good harbors on the Gulf coast. Veracruz is an open roadstead, and we are now spending large sums of money in trying to make it a good port. Our best harbors are on the Pacific coast, as Acapulco, which is a large one ; Manzanillo, a very fine although a very small one ; and La Paz, on the Gulf of California. By artificial means we expect to improve our harbors considerably.

The development of the harbor of Tampico is remarkable. A short time ago the depth of the bar roadstead was only eight or nine feet. Now steamships drawing twenty-four feet of water enter the port. The deepening of the entrance to the harbor has been accomplished by means of jetties, just as the mouth of the Mississippi was deepened by the Eads jetties. A very large part of the imports of Mexico enter now by the port of Tampico.

The more noteworthy bays are those of Guaymas, Santa Barbara, Topolobampo and Navachiste, in the Gulf of California ; Concepción, La Paz, and Mulejé, on the west coast of the same gulf ; San Quentin, Magdalena, and Amejas, on the Pacific coast of Lower California ; and San Blas and Valle de Banderas, on the coast of Tepic.

We have no lakes as large as those with which the United States is favored, and the Lake of Chapala, a beautiful spot where country houses are now being built, is the largest lacustrine basin in Mexican territory. The Valley of Mexico has six lakes, two of fresh and six of salt water. The other lakes in Mexico are Catemaco, in the State of Veracruz ; Cairel and Carpintero, in the State of Tamaulipas ; Encantada, in Tabasco ; Bacalar, in Yucatan ; Alcuzaque, in Colima ; Cuitzeo, Tacascuaro, and Patzcuaro, in Michoacan ; Yuriria, in Guanajuato ; and Meztitlan, in Hidalgo.

Mexico has a great many islands, situated near the coast, although not any of very great area, the greater number being uninhabited, although some of them are very fertile, and could be the seat of a large population. Among the most important are: El Carmen, the largest in the Gulf of Mexico; San Juan de Ulua and Sacrificios, opposite the port of Veracruz; Mujeres, in the Caribbean Sea; Guadalupe, about seventy-five miles from the west coast of Lower California; the Tres Marias group, about thirty miles from the same coast; the Revillagigedo group, not far from the coast of Colima; and adjoining the coast of the State of Michoacan, the Alcatraz Island.

As I have already stated, Mexico has a very broken surface, with high mountains, causing streams to run down a very inclined plane, forming torrents with rapid cascades, which contribute to embellish the natural features of the country. These conditions, however, prevent us from having large navigable rivers, and furnishing a cheap way of transportation, which is one of the greatest advantages the United States enjoys, and which so largely contributed in its early days to the development of the country, making transportation to long distances both easy and cheap. While the torrents descending from the mountains afford an immense water-power—which, in the course of time, may be used as a motor for industrial purposes—they meet when they reach a valley and run smoothly there through a ravine until finally they reach the coast, and it is therefore only at a comparatively small distance from the sea that they can be made navigable.

Our principal rivers, measuring their positions from north to south, are the Rio Grande—which from El Paso, Texas, to the sea, is the boundary line between the two countries, and which used to be a large river; but as it rises in Colorado and passes through New Mexico, and the inhabitants of both have taken for irrigation purposes most of the water that it carries, it becomes entirely dry during the dry season after the freshets, very much to the distress of the inhabitants of its borders from El Paso to Ojinaga, especially on the Mexican side, which has been inhabited for three hundred years, the people using the water for irrigation—on the other side there being hardly any population,—and now they find that their farms are entirely worthless for want of water. After passing Presidio del Norte, now called Ojinaga, the Conchos River and other tributaries of the Rio Grande River supply it with water, although not to the extent it had before the water was taken in Colorado and New Mexico. The Mescala, or Balsas River, rises in the central plateau near the Valley of Mexico, passes by the State of Puebla to the southwest, by Mixteca of Oaxaca, and finally empties into the Pacific at Zacatula. As indicated by its name, it is, to a limited extent, navigable along its lower reaches; above the bar it is accessible to small craft, which, higher up, are arrested by rapids,

whirlpools, and a high cascade. The Pánuco River rises north of the Valley of Mexico. Under the names of Tula and Montezuma it describes a vast semicircular bend towards the west across the Hidalgo uplands and collects the waters of the Huasteca of Veracruz and Tamaulipas, beyond which it is joined by the various streams flowing from Queretaro, and finally empties into the Gulf of Mexico at the port of Tampico. The Tampico bar, improved by jetties, is now the best harbor on our Gulf coast. The Rio Lerma or Santiago, the Tololotlan of the Indians, is also a considerable stream. By the riverain populations it is, in fact, known as the Rio Grande, while the inhabitants of Michoacan call it also Cuitzeo, from the large lake situated in their State. It rises in the State of Mexico in the very centre of the Anahuac plateau, and its farthest sources, issuing from underground galleries, descend from the Nevado de Toluca down to the twin lake of Lerma, the remains of an inland sea which formerly filled the Upper Toluca valley north of the Nevado volcano. At its issue from the lake, or rather marshy lagoon, the Lerma stands at the great altitude of 8600 feet, and during its winding northwesterly course across the plateau, the incline is very slight. In this upland region it is swollen by several affluents, some of which, like the main stream itself, flow from lakes dotted over the table-land. After completing half of its course at La Barca, the Lerma is still 5600 feet above sea-level. Here, some 280 miles from its source, it enters the large Lake Chapala, near its eastern extremity; but about twelve miles below the entrance it again emerges through a fissure on the north side of the lake, and still continues to flow throughout its lower course in the same northwesterly direction.

The Grijalva and Usumacinta rivers, rising in the State of Chiapas, after being joined by many others, some of them coming from Guatemala, empty into the Gulf of Mexico by one of its mouths at the city of Frontera in the State of Tabasco. The Papaloapam River rises in the State of Oaxaca, passes through the State of Veracruz, and empties into the Gulf of Mexico at the town of Alvarado, a few miles south of Veracruz.

The rains increase considerably the amount of water in the rivers, but as their duration is not very long this soon subsides. When the streams rise near the sea, as is the case on the coast of Chiapas on the Pacific, they become so swollen immediately after the rains that it is impossible to ford them, and as there are no bridges, it is necessary to wait until early the next day when the freshet has subsided.

Springs are rare, and some of the rivers run in deep mountain beds, without receiving smaller tributaries, while the rapid evaporation on a light soil, covering porous rocks, leaves the surface dry and hot and unable to support much vegetation beyond the cactus and low grasses.

We are blessed with quite a number of mineral springs, although very few of them are used, most of them being at places not easily accessible ; but in this regard I do not think we have any cause to envy any other country.

CLIMATE.

By looking at the map it will be perceived that Mexico, being intersected by the Tropic of Cancer and stretching across eighteen parallels of latitude, must, from its position alone, necessarily enjoy a great diversity of climate. But from its peculiar configuration this feature is affected far more by the altitude of the land than by its distance from the pole or the equator. This is especially true of the more fertile and populous section lying within the torrid zone, where three distinct climatic regions are distinguished, not according to their horizontal, but according to their vertical position. The warm climate has the heat of the torrid zone and prevails on the sea-coast in the sandy and marshy tracts fringing the Gulf of Mexico and the Pacific Ocean, in other low places below 3000 feet above the level of the sea, and in some of the valleys higher than that, but protected entirely from the winds. But the night breezes refresh the temperature in the evening and make it bearable during the day, the heat never being so oppressive as it is in summer in the more northern latitudes. This region is also much refreshed in summer by the rains, which are abundant and fall regularly during that season. The heat of the sun increases considerably the evaporation from the sea, and when the evaporation reaches the cool atmosphere of the sky, it is naturally condensed into water and falls in this region. The rains begin generally in June, increase considerably in July, and end in November, although this varies in different regions, the rains lasting longer in those near the sea than in the inland districts. They are so abundant that they form the main reliance of the agricultural industry, and there are few regions which use water for irrigation, depending entirely upon the rainfall ; therefore, when in a year by some atmospheric phenomena, the rains are late or very scarce, we had a famine in Mexico, which can now be averted by importing cereals through our railroads, as was the case in 1893. The rains fall regularly and at fixed intervals, that is, about from one to three hours every day, and after the rain is over, the atmosphere is clear and pleasant, and in well drained places the ground becomes dry, so that it causes no inconvenience to the inhabitants.

The rains have such a decided effect on the atmosphere that in most of the country the seasons are divided into the rainy and dry season, and very few realize what spring and fall mean. As our climate is so even, the trees do not lose their leaves at any given time, but one

by one as they grow old and die ; and as the leaves die they are replaced gradually and imperceptibly by new ones, so that the phenomenon familiar to northern latitudes, of trees losing all their leaves in the autumn and regaining them in the spring, is quite new to anybody going to a temperature that has both extremes.

♪ The differences of climate depending upon the different degrees of altitude are so great in Mexico that the vegetable products of this vast country include almost all that are to be found between the equator and the polar circle.

The mean temperature in the hot region varies from 77 to 82 degrees, Fahrenheit, seldom falling below 60, but often rising to 100 degrees, and in the sultry districts of Veracruz and Acapulco occasionally to 104 degrees, although the heat is not oppressive as is the summer heat of the eastern portions of the United States. The vegetation is, of course, in consequence entirely tropical. In the southern region the climate on both seaboards may be described as humid, hot, and rather unhealthy, and in places where stagnant water and marshes exist—which are often found on the coast on account of the sea water flowing in and remaining there—intermittent and remittent fevers prevail, and in some localities during the summer yellow fever and black vomit are endemic. These conditions could easily be remedied by proper drainage of the swamps and marshy districts.

The heat of the Gulf of Mexico when the atmosphere begins to cool in the polar regions causes a depression in the barometer, and consequently very strong north winds, which sweep over the coast with terrible force, causing great havoc. They generally begin in September and last until the winter season sets in about December. As the country is narrow, the effect of the north wind is felt all over it and that is the prevailing wind. In the City of Mexico, for instance, notwithstanding its altitude and that it is protected by high mountains from the northern winds, the temperature falls when the northerns prevail on the Gulf coast, and it becomes cloudy and drizzly, and the same effect is felt, more or less, in other portions of the country. As the country narrows towards the southeast, especially at Tehuantepec, the northern wind blows with but small obstacles, and its force and effects are felt all over it. The districts in the mountains bordering the Pacific are affected in the same way as the City of Mexico.

From 3000 to 5000 feet above the level of the sea is located our temperate zone, which succeeds the hot zone in a verticle position, and embraces all the higher terraces, and portions of the central plateaus themselves. The mean temperature is from 62 to 70 degrees, Fahrenheit, varying not more than 4 to 5 degrees during the season, thus making one of the very finest climates on the face of the earth. In this privileged region both extremes of heat and cold are unknown,

and it has several cities—Jalapa and Huatusco in the State of Veracruz, Chilpancingo in Guerrero, Ameca in Jalisco, and many others too numerous to mention here. As these places are generally located on the slopes of mountains and not far removed from the ocean, the evaporations from the sea form clouds which are detained in their course by the high peaks and are precipitated into rain. In this region the semi-tropical productions are abundant, and with them are often combined the products of tropical and cold regions. I have seen in my own native place, the city of Oaxaca, located in the temperate region, a farm where wheat and sugar-cane were growing on the same piece of ground.

The cold region is located from 7000 feet above the sea-level upwards, and has a mean temperature of from 59 to 63 degrees, Fahrenheit. Most of the grand central plateau is located in this region, except in such places as are in a great depression of ground and in deep ravines, where a warm temperature and tropical products are found. The rainfall is about five times less than in the temperate zone. This region, of course, produces all the growths of the cold latitudes, as wheat, oats, apples, etc., etc.

The portion of the country that is most thickly inhabited lies in the central plateau, and is quite high above the level of the sea, and so sheltered from the winds and storms by the mountains as to make the climate even, temperate, and delightful. The impression prevails in the United States that Mexico, lying to the south and running towards the equator, must be much warmer than this country; but this is not so. Even in warm places, like the lowlands on the coast, we do not have the extreme hot weather that is experienced in summer in the United States. The sea breezes refresh the atmosphere at night and cool it considerably, making, therefore, a very great contrast with the summer heat in this country. The medium climate of the Valley of Mexico, for instance, which is the one that has been best observed and understood, varies comparatively little between summer and winter, its greatest variations being between day and night on the same day.

The climatic conditions of Mexico are undergoing great changes on account of the destruction of the forests. The country had formerly a great deal of rain and much humidity in the atmosphere, being covered with thick forests; but with the difficulty of transporting the coal already found, the population has had to depend entirely for their supply of fuel upon charcoal, and this has in the course of time denuded the mountains, changing very materially the climatic conditions of some regions in the country. But in the lowlands, being thinly inhabited, the case is different, and the country is still so thickly wooded that it is impossible to pass through it, unless an open path

is made with a great deal of difficulty, by felling very high trees and low brush and weeds. In this region abound forests of mahogany, cedar, rosewood, etc. I will later state more in detail the conditions of the fuel question in Mexico.

As a whole, the Mexican climate, if not of the most invigorating nature, is certainly one of the most delightful in the world. The zone of temperate lands, oceanic slopes, enjoy an everlasting spring, being exposed neither to severe winter, nor to intolerable summer heats; in every glen flows a rippling stream; every human abode is embowered in leafy vegetation; and here the native plants are intermingled with those of Europe and Africa. Each traveller in his turn describes the valley in which he has tarried longest as the loveliest in the world; nowhere else do the snowy crests or smoking volcanic cones rise in more imposing grandeur above the surrounding sea of verdure, all carpeted with the brightest flowers. In these enchanting regions there is still room for millions and millions of human beings.

The following table prepared by the Meteorological Observatory of the City of Mexico shows the meteorological conditions of the principal Mexican cities during several years, their elevation upon the sea-level being marked in metres and the temperature under the Centigrade scale.

SUMMARY OF THE METEOROLOGICAL OBSERVATIONS TAKEN IN SEVERAL CITIES OF MEXICO DURING SEVERAL YEARS.

LOCALITIES.	N. Lat.	Height above sea-level.	Number of years of observation.	Mean barometrical pressure.	TEMPERATURES IN THE SHADE.			Relative humidity.	CLOUDS.		WIND.		Rainfall. Average for a year.
					Max.	Min.	Mean.		Average.	Prevailing direction.	Prevailing direction.	Mean velocity.	
	°	m.		mm.	°	°	°						mm.
Monterey, N. L.	25 40	495.6	1	709.1	33.2	11.7	21.0	...	...	...	S.E.	...	3413.5
Saltillo, Coah.	25 25	1633.0	4	632.1	34.0	-2.8	16.8	61	4.4	N.	N.	1.4	527.3
Culiacan, Sin.	24 48	34.2	1	754.9	35.9	12.5	25.6	62	...	...	...	...	125.2
Mazatlan, Sin.	24 11	4.0	4	759.3	34.1	10.3	25.2	77	3.4	N.W.	N.W.	1.7	510.2
Zacatecas, Zac.	22 46	2496.0	10	573.4	21.8	6.1	13.2	48	3.2	S.E.	S.E.	2.6	819.1
San Luis Potosi, S. L. P.	22 9	1890.0	9	613.4	33.9	-1.8	17.4	60	4.4	W.	E.	1.3	389.0
Pabellon, Ag.	22 4	1924.0	10	607.8	24.0	12.2	18.2	57	4.0	S.S.E.	W.S.W.	1.2	537.0
Aguascalientes, Ag.	21 53	1861.0	1	605.1	29.5	2.8	18.6	...	...	...	N.	...	542.2
Huejutla, Hid.	21 41	376.0	1	765.1	34.0	10.0	23.0	81	...	...	...	...	2019.3
Leon, Gto.	21 7	1798.0	14	617.4	35.6	-1.1	18.9	66	4.9	S.W.	N.N.W.	0.6	729.8
Guanajuato, Gto.	21 1	2060.0	5	601.3	30.7	1.3	17.6	58	5.3	...	...	...	964.5
Tuxpam, Ver.	20 59	...	2	763.0	...	...	24.5	82	4.3	N.W.	W.	...	1654.3
Guadalajara, Jal.	20 41	1567.0	7	636.2	35.5	-4.5	19.7	53	...	...	...	...	861.9
Queretaro, Que.	20 35	1850.0	3	613.8	33.1	...	18.1	59	4.1	...	E.	0.6	602.2
Pachuca, Hid.	20 7	2460.0	1	574.8	27.2	0.6	13.7	59	4.2	S.W.	N.E.	2.4	436.8
San Juan del Rio, Que.	19 49	1976.0	1	...	...	...	18.3	60	3.5	E.	N.E.	...	567.1
Patscuaro, Mich.	19 31	2138.0	1	...	...	...	16.1	...	4.3	E.	W.	...	1110.4
Mexico, D. F.	19 26	2282.5	15	586.4	31.6	-1.7	15.4	60	5.0	S.W.	N.W.	0.8	614.8
Tacubaya, D. F.	19 12	2322.6	9	583.6	28.6	0.8	15.5	62	...	...	N.W.	...	668.1
Puebla, Pue.	19 03	2172.0	14	593.2	31.9	-1.1	15.7	63	4.7	E.N.E.	N.E.	1.9	926.0
Tlaxotampam, Ver.	18 36	3.5	1	760.4	...	...	25.3	80	4.8	N.	N.E.	...	2264.0
Oaxaca, Oax.	17 04	1541.0	1	636.6	32.9	6.2	20.6	80	...	...	W.	...	649.3

SUMMARY OF THE METEOROLOGICAL OBSERVATIONS TAKEN IN SEVERAL LOCALITIES OF MEXICO,
DURING THE YEAR 1869.

LOCALITIES.	N. Lat.	Altitude above the sea.	BAROMETRICAL PRESSURE REDUCED TO 0°.			TEMPERATURE IN THE SHADE.			RAIN.				CLOUDS.	WINDS.		Maximum velocity per second.	EVAPORATION.		
			mean.	max.	min.	min.	m'x.	max.	Days of Rain.	Total Rain.	Rainiest Month.	Highest rainfall in 24 hrs.		Mean annual rainfall.	Dominant direction.			Average velocity per second.	Prevailing direction.
Aguascalientes.....	21° 40'	1939.0	mm.	mm.	mm.	°	°	°	107	82.9	July.	mm.	5.1	W.	2.6	E. & N. W.	16.7	mm.	
Colima (Seminario).....	19° 11'	247.7	718.3	601.1	501.1	34.4	37.2	9.4	69	71	Oct.	81.6	5.2	S. W.	2.6	S. W.	6.7	4.2	
Colima.....	19° 11'	247.7	718.3	601.1	501.1	34.4	37.2	9.4	69	71	Oct.	81.6	5.2	S. W.	2.6	S. W.	6.7	4.2	
Guadalajara.....	21° 0'	1860.8	694.7	630.7	530.7	18.9	36.1	1.2	112	1597.8	Aug.	125.0	4.8	E. & N. E.	0.8	N. E.	10.5	4.6	
Guadalupe.....	21° 1'	2060.0	631.6	606.5	506.5	18.4	34.1	2.0	48	107	June.	88.8	4.0	S. E.	1.8	N. E.	10.5	4.0	
Jalapa.....	19° 31'	1450.0	640.3	606.5	506.5	18.5	33.5	5.6	202	1799.4	June.	367.8	6.2	S. W.	1.5	N. E.	36.0	3.2	
Lagos.....	21° 2'	1912.5	613.5	618.6	518.6	18.4	34.3	3.6	58	109	Oct.	87.8	3.0	S. W.	2.1	N. E.	36.0	4.3	
Leon.....	21° 7'	1798.6	617.2	622.8	517.2	19.3	34.7	2.4	47	117	July.	113.4	4.9	S. W.	2.1	S. S. W.	15.6	3.9	
Magdalena.....	20° 36'	1568.0	617.2	622.8	517.2	19.3	34.7	2.4	47	117	July.	113.4	4.9	S. W.	2.1	S. S. W.	15.6	3.9	
Massalan.....	20° 36'	1568.0	617.2	622.8	517.2	19.3	34.7	2.4	47	117	July.	113.4	4.9	S. W.	2.1	S. S. W.	15.6	3.9	
Merida.....	20° 53'	7.5	739.8	764.9	749.3	25.4	33.5	11.7	75	70	July.	186.9	3.2	N.	1.7	W.	22.0	2.3	
Mexico (Central Observat.).....	19° 20'	2777.5	586.2	591.9	586.2	15.3	31.8	12.1	72	118	Oct.	103.0	4.9	N. E.	1.2	N. & N. W.	6.2	2.3	
Mexico (National School of Young Ladies).....	19° 20'	2777.5	586.2	591.9	586.2	15.3	31.8	12.1	72	118	Oct.	103.0	4.9	N. E.	1.2	N. & N. W.	15.0	2.3	
Monterrey.....	25° 40'	495.6	714.9	787.7	703.4	16.3	31.0	1.0	89	142	Oct.	31.1	5.0	N. W.	...	N. W.	...	6.0	
Monterrey.....	25° 40'	495.6	714.9	787.7	703.4	16.3	31.0	1.0	89	142	Oct.	31.1	5.0	N. W.	...	N. W.	...	6.0	
Monterrey.....	25° 40'	495.6	714.9	787.7	703.4	16.3	31.0	1.0	89	142	Oct.	31.1	5.0	N. W.	...	N. W.	...	6.0	
Oaxaca.....	17° 2'	1574.1	618.9	642.2	542.2	18.8	31.5	1.5	63	159	July.	131.9	5.5	N. E.	1.4	S. S. W.	11.3	4.8	
Pachuca.....	20° 7'	2425.0	573.5	578.9	560.1	14.1	30.7	0.2	73	57	Sept.	152.2	3.8	N. E.	1.5	N. E.	18.7	6.1	
Puebla (Catholic College).....	19° 2'	2107.7	594.0	598.0	560.0	17.5	31.5	1.8	58	129	Sept.	89.7	3.7	N. E.	3.3	N. E.	20.0	...	
Queretaro.....	20° 36'	1850.0	616.0	621.4	560.0	18.4	34.5	1.0	54	88	Sept.	74.5	4.1	N. E. & S. W.	1.4	N. E.	18.0	...	
Real del Monte.....	20° 36'	2772.2	548.6	552.3	543.0	13.1	30.5	0.1	62	435.0	Sept.	16.8	4.0	N. E.	1.4	N. E.	20.0	3.3	
San Luis Potosi.....	25° 25'	1045.5	639.3	636.5	544.1	18.5	34.3	4.2	63	86	Oct.	216.0	3.7	N. E.	1.4	N. S.	12.2	4.1	
San Luis Potosi.....	25° 25'	1045.5	639.3	636.5	544.1	18.5	34.3	4.2	63	86	Oct.	216.0	3.7	N. E.	1.4	N. S.	12.2	4.1	
Silao.....	20° 56'	1848.0	616.2	621.9	560.3	19.5	32.4	4.0	58	99	July.	86.4	3.5	N. E.	0.7	S. E.	11.7	3.3	
Toluca.....	19° 17'	2625.0	556.6	560.5	531.9	13.8	32.7	3.8	58	146	July.	160.2	4.6	N. E.	2.2	W. & S. W.	10.0	2.4	
Trejo (estate of).....	20° 56'	1848.0	616.2	621.9	560.3	19.5	32.4	4.0	58	146	July.	160.2	4.6	N. E.	2.2	W. & S. W.	16.7	1.7	
Veracruz.....	19° 11'	14.6	762.5	766.1	766.1	25.0	31.1	15.9	76	1530.1	Sept.	183.4	...	N. E.	...	N. E.	...	3.0	
Zacatecas.....	22° 46'	2443.0	577.4	588.0	568.0	16.1	31.0	5.8	52	52	Nov.	177.5	5.2	N. E.	2.9	S. W.	17.1	4.0	
Zapotlan.....	19° 36'	1568.0	636.8	640.4	633.6	20.5	35.9	6.0	...	151	July.	260.5	5.6	N. E.	2.6	S. E.	18.0	2.1	

The table on page 39 shows the results of the meteorological observations taken in the principal cities of Mexico during the year 1896.

Professor Mariano Barcena, director of our National Meteorological Observatory or Weather Bureau, furnished me the following data about the maximum and minimum of temperature and greatest oscillation both in summer and winter of several cities in Mexico, located both at the sea-level like Merida and Mazatlan, at different altitudes like Jalapa, San Luis Potosi, Oaxaca, and at the highest level like the cities of Mexico, Pachuca, and Zacatecas, showing the mildness of the Mexican climate.

CITY OF MEXICO.

Maximum temperature in the shade in summer..... 84.9, May 5th.
 Maximum temperature in winter..... 72.0, December.
 Minimum temperature in winter..... 32.9, January and February.
 Greatest oscillation in one day in winter..... 13.7
 Greatest oscillation in one day in summer..... 32.9

PUEBLA (STATE OF PUEBLA).

Maximum temperature in the shade in summer..... 83.8, April.
 Maximum temperature in winter..... 74.7, February.
 Minimum temperature in winter..... 32.9, January.
 Greatest oscillation in one day in winter..... 36.3
 Greatest oscillation in one day in summer..... 34.4

OAXACA (STATE OF OAXACA).

Maximum temperature in the shade in summer..... 93.7, May.
 Maximum temperature in winter..... 83.1, February.
 Minimum temperature in winter..... 39.2, January and December.
 Greatest oscillation in one day in winter..... 39.1
 Greatest oscillation in one day in summer..... 37.8

JALAPA (STATE OF VERACRUZ).

Maximum temperature in shade in summer..... 89.6, April.
 Maximum temperature in winter..... 87.1, December.
 Minimum temperature in winter..... 33.8, February.
 Greatest oscillation in one day in winter..... 35.3
 Greatest oscillation in one day in summer..... 32.0

QUERETARO (STATE OF QUERETARO).

Maximum temperature in the shade in summer..... 90.1, April and June.
 Maximum temperature in winter..... 80.4, December.
 Minimum temperature in winter..... 32.9, January.
 Greatest oscillation in one day in winter..... 39.4
 Greatest oscillation in one day in summer..... 34.7

GUANAJUATO (STATE OF GUANAJUATO).

Maximum temperature in the shade in summer.....	91.9, April.
Maximum temperature in winter.....	82.0, February.
Minimum temperature in winter.....	36.0, January.
Greatest oscillation in one day in winter.....	36.7
Greatest oscillation in one day in summer.....	36.7

LEON (STATE OF GUANAJUATO).

Maximum temperature in the shade in summer.....	91.6, May and June.
Maximum temperature in winter.....	77.0, February.

PACHUCA (STATE OF HIDALGO).

Maximum temperature in the shade in summer.....	80.2, May.
Maximum temperature in winter.....	77.0, December.
Minimum temperature in winter.....	32.4, December.
Greatest oscillation in one day in winter.....	33.3
Greatest oscillation in one day in summer.....	28.6

REAL DEL MONTE (STATE OF HIDALGO).

Maximum temperature in the shade in summer.....	80.2, March.
Maximum temperature in winter.....	74.1, January.
Minimum temperature in winter.....	31.6, January.

SALTILLO (STATE OF COAHUILA).

Maximum temperature in the shade in summer.....	89.6, April.
Maximum temperature in winter.....	75.7, January.
Minimum temperature in winter.....	12.2, February.
Greatest oscillation in one day in winter.....	32.8
Greatest oscillation in one day in summer.....	25.6

MERIDA (STATE OF YUCATAN).

Maximum temperature in the shade in summer.....	103.6, April and June.
Maximum temperature in winter.....	92.8, January.
Minimum temperature in winter.....	47.8, February.
Greatest oscillation in one day in winter.....	37.1
Greatest oscillation in one day in summer.....	38.7

MAZATLAN (STATE OF SINALOA).

Maximum temperature in the shade in summer....	91.0, September.
Maximum temperature in winter.....	84.0, December.
Minimum temperature in winter.....	15.8, February.
Greatest oscillation in one day in winter.....	16.9
Greatest oscillation in one day in summer.....	17.5

MEXICO AS A SANITARIUM.

Although the City of Mexico, on account of its present unsatisfactory sanitary conditions, of which I will treat in speaking of that city and which I am sure will be remedied before long, cannot be considered now as the best place for invalids, there are many other localities in the country presenting great advantages as sanitariums.

The mild nature and evenness of most of our climate is very favorable to certain diseases—especially pulmonary ones—and when that advantage becomes well known the central plateau of Mexico will be the best sanitarium for lung diseases, and especially for tuberculosis. Other lung diseases requiring a warmer climate could find desirable places in certain valleys in the temperate zone like Cuantla, Cuernavaca, Tasco, Iguala, and others. These very conditions, namely, the even and mild climate both in summer and winter, will make it a country visited by thousands of pleasure or health seekers who wish to escape both extremes of the northern climate. Even now we would have a much larger travel from this country if we had convenient accommodations for travellers, but our hotels are not yet as comfortable as those in the United States.

FLORA.

The short and imperfect description of the climate of Mexico, made above, will show that we can raise all the products of the three different zones into which the earth is divided, and the most remarkable thing is that we can raise them almost on the same ground. By going only a few miles, for instance, travelling on horseback four or five hours from a low to a higher locality, we change from the torrid to the temperate zone, and therefore we can have the products of both with comparatively little trouble; and by going four or five hours higher still, we change from the temperate to the frigid zone, and these are advantages of our geographical position which can be appreciated only by those who have experienced them.¹

¹ Mr. Charles Dudley Warner, editor of *Harper's Monthly Magazine*, in a brilliant article published in the July, 1897, number of that periodical, gives the following description of the rapid descent from the cold to the temperate and hot regions of Mexico, which may be considered as a specimen of the scenery in many other localities of that country. In many other places, where there are no wagon-roads, but only a footpath, the descent is a great deal more rapid, often 5000 feet in four or five miles, and then the contrast is still greater. At Maltrata for instance, an Indian town about 5000 feet above the level of the sea, the natives offer their tropical fruits to the passengers of the Mexican Railway going from Veracruz to the City of Mexico, and they leave with what they have left after the train starts to climb the mountains to the Central Plateau to an altitude of about 9000 feet, and they reach Esperanza, the first station on the Central Plateau far ahead of the train, which has to describe a long, zigzag course before getting there. I have selected the following extract from Mr. Warner's article because it relates to one of the historical places of Mexico:

“Cuernavaca is distinguished as the actual meeting-place of the pine and the palm. It lies only a little more than fifty miles south of the City of Mexico; but in order to reach it there is a mountain to be crossed which is at an elevation of over ten thousand feet. A railway climbs up this mountain, over the summit, to a wind-swept plain, in the midst of pine forests, called Tres Marias—marked by the slightly peaks of the Three Marys. By long loops and zigzags it is crawling down the mountain on

The Mexican Southern Railway, from Puebla to Oaxaca, descends in a few hours, by a series of fertile terraces, from an elevation of seven thousand feet to one of about seventeen hundred and fifty feet, when the wonderful Cañon de los Cues is reached, a region of cocoa-nuts and bananas. But all the valleys and terraces in March are green or yellow with wheat and corn and sugar-cane. It confuses one's ideas to pass a field of wheat, the green blades just springing from the ground, and then a field ripe for harvest, and then a threshing-floor where the grain is being trodden out by mules. This means that you can plant and reap every day in the year, if you can obtain water in the dry season, and do not wait for the regular and copious summer rains.

The magnificent arboreal vegetation embraces one hundred and fourteen different species of building timber and cabinet woods, including oaks, pines, firs, cedars, mahogany, and rosewood; twelve species of dyewoods; eight of gum trees: the cacao and india-rubber, copal, liquid-ambar, camphor, turpentine, pine, mezquite yielding a substance

the other side to Cuernavaca. Mexico City has an elevation of seven thousand five hundred feet, Tres Marias of about ten thousand, and Cuernavaca of five thousand. The descent by the wagon-road is in length only twelve miles, but the drop in that distance is five thousand feet, so that the traveller passes very quickly from temperate to tropical conditions. . . .

"From the heights Cuernavaca seems to lie in a plain, but it is really on a promontory between two barrancas, and the whole country beyond is broken, till the terraces fall off into more tropical places, where the view is bordered by purple mountains. Indeed, the little city in the midst of this tumultuous plain is surrounded by lofty mountains. The country around, and especially below to the south, is irrigated, and presents a dozen contrasts of color in the evergreen foliage, the ripening yellow crops of sugar-cane and grain, the clusters of big trees here and there about a village or a hacienda, and the frequent church-towers. All this is loveliness, a mixture of temperate and tropical grace, but there is grandeur besides. Looking to the east, say from the Palace of Cortez, over the fields of purple and green and yellow and brown, where the graceful palms place themselves just as an artist would have them in the foreground of his picture, the view is certainly one of the finest in the world. There is in the left the long mountain range with the peaks of Tres Marias, and along the foot of it haciendas and towers, cones of extinct volcanoes and noble rocky promontories. To form the middle-distance mountains come into the picture, sloping together to lead the eye along from one "value" to another, violet, purple, dark or shining as the sun strikes them, while on the left is a noble range of naked precipices of red rock, always startling in color. It is some two thousand feet up the side of one of these red cliffs that there is the remains of an ancient city of Cliff-dwellers—almost inaccessible now, but once the home of a race that understood architecture and knew how to carve. The lines of this natural picture, the fields, the intervening ledges, the lofty mountains, all converge to the spot the artist would choose for the eye to rest, and there, up in the heavens, are the snow-clad peaks of Popocatepetl and Iztaccihuatl, about seventeen thousand five hundred feet above the sea, volcanic creators of the region, and now undisputed lords of the landscape. In the evening these peaks are rosy in the sun; in the morning their white immobility is defined against the rosy sunshine."

similar to gum-arabic, dragon trees, and the almácigo or *Callitris quadralvis*, from which sandarac is extracted. Among the oil-bearing trees and plants, of which there are seventeen varieties, are the olive, cocoa palm, almond, sesame, flax, the tree yielding the balsam of Peru, and others. There are fifty-nine classified species of medicinal plants, and many more are mentioned by botanists as still unclassified by science.

Of the many delicious fruits which grow in the tropical regions, only a few—the pineapple, the banana, and the cocoa-nut—are known in this country, the orange being rather a semi-tropical fruit. The others require, as all fruits do, cultivated taste, and, therefore, if imported here would not find a market. Even those which do come here are of very inferior flavor, owing to the fact that they are cut green so as to prevent their decay during transportation, and they, of course, have a less agreeable taste than in the place where they grow. Of the banana, for instance, we have about twenty varieties, some of which—the richest in my opinion—grow to a size from twelve to fifteen inches in length and from two to three inches in diameter.

We can raise in Mexico all the products of the world because we have all climates, from the perpetual snow to the burning sun of the equator; but it would take a great deal more space than I can dispose of in this paper, to mention all the agricultural products we can raise, and I will, therefore, confine myself to only such as I think are now of more importance.

Coffee.—Mexico has many localities well suited for the raising of coffee, and the production of that berry can in the future be very largely increased. In the proper locality, namely, zone, ground, and climate, coffee can be raised on a large scale at comparatively small cost, affording always a large profit, whatever may be in the future its price in foreign markets.

I have had personal experience in coffee-raising, having made a coffee plantation in the district of Soconusco, in the State of Chiapas; and I took especial interest in visiting other plantations, both in Mexico and Guatemala, where coffee had attained a large development. My experience has shown me that the best zone for coffee is located between one and five thousand feet above the level of the sea, as coffee is not a product of the hot but of the temperate zone. On the highlands, as a rule, the quality of the coffee is better and the yield large, while the lowlands give an earlier but smaller yield. There are coffee plantations in Mexico, almost down to the level of the sea, which are yielding coffee, and from that to the elevation of six thousand feet, producing also a very good quality of coffee. For further information on this subject, I refer the reader to a treatise on coffee-raising on the southern coast of the State of Chiapas, which I published in the City of

Mexico in 1874, and which contains detailed information on the several factors affecting that industry.

It is interesting to know the production of coffee in Mexico, taken from some statistics for 1896 :

Cordoba produces.....	10,000,000 lbs.
Huatusco and Coatepec	10,000,000 "
Oaxaca.....	6,000,000 "
Tabasco.....	5,000,000 "
Chiapas	3,000,000 "
Other districts.....	26,000,000 "
	<hr/> 60,000,000 lbs.

Sugar-Cane.—Mexico has many localities where sugar-cane can be raised at a very small cost, and where that industry can be made very lucrative, although we hardly produce enough sugar for our home consumption. From the sea-level to the frost line, which ranges, in different localities, from three to five thousand feet above the sea-level, sugar-cane can be raised in Mexico to great advantage. I have seen the cane in some places, especially in Soconusco, attain a height of twelve feet and a diameter of about five inches ; and in some localities it lasts from ten to eighteen years without need of replanting, and can be cut for grinding twice a year. When it is considered that in some places, like Louisiana, sugar has to be planted, as I believe, every two years, and that it is liable to be destroyed by frosts, the advantages of Mexico for that industry are apparent.

The favorable conditions of Mexico for raising sugar-cane are so great that I have seen the natives in the Indian town of Loxicha, in the State of Oaxaca, plant a small plot of sugar-cane, grind it with primitive wooden mills moved by hand power, using very primitive earthen pans, to evaporate the juice and make brown sugar—losing of course a great part of the saccharine matter in the cane,—transport the sugar, sometimes a distance of thirty miles on mule-back, and sell it at one cent per pound, and still make a profit.

For sugar-cane the lowlands are the best, and the plant is essentially a tropical one. It will grow, however, at very considerable altitudes, but when planted in the mountains it takes a longer time to ripen, and soon ceases to give remunerative crops. There was in southern Veracruz a sugar-cane only six months old which had a circumference of $7\frac{1}{2}$ inches. Where that cane grew the yield of cane per acre was about 80 tons when twelve months old. The elevation was something like 1000 feet. It is true, however, that the bulk of the cane grown in Mexico is to be found above 2000 feet, but I am convinced that a lower altitude would produce even better results.

Tobacco.—Among the tropical products of superior quality that we

raise in the hot zone, I should mention tobacco, the Mexican tobacco being, in General Grant's estimation, superior to the Havana article. The natural conditions of soil and temperature are the same in Cuba and Mexico, but we had not the superior experience of the Cubans in curing the leaf until the late insurrection broke out in Cuba, in 1868, when a great many Cubans went to Mexico to plant tobacco. As the land has been planted in Cuba with tobacco for nearly four hundred years, and as tobacco is a very exhausting crop, it has become indispensable to manure the land with guano, while in Mexico we have virgin land, and tobacco being a comparatively new industry; no guano needs to be used. General Grant, whom I consider a competent judge, detected the taste of guano in the Havana cigars, of which ours is free, and he, therefore, preferred to smoke the Mexican cigars.

In Cuba the exhausted soil cannot produce all the leaves that are required for the world's supply of Havana cigars, and the want can only be filled through the use of Mexico leaf tobacco, the weed produced in other countries having similar conditions. The Marquis de Cabañas sent to Sumatra a quantity of seed when it became obvious that the soil of the tobacco region of Cuba was fast being worn out. He sent seed also to Java and to the United States, but it was found that it was impossible to raise tobacco of the quality of that raised in Havana anywhere but in Mexico. That raised in Java from Havana seed was very coarse and rank, replete with nicotine and meconic acid, and devoid of those delicate essential oils that give the Havana and Mexican tobacco their fine aroma.

The tobacco plant is a native of the tropics, and thrives best in the hot lands. It is a hardy plant, however, and will grow well in northern latitudes in the summer time. It often happens that the land in the tropics is actually too rich for the successful cultivation of tobacco.

India-Rubber.—The lowlands of Mexico, especially those adjoining the Pacific Ocean and which have a very warm and moist climate, are very well adapted for the india-rubber tree, which attains a large size and yields a considerable amount of india-rubber. We used to have whole forests of them, which fact shows that they were in their proper conditions of soil and climate, as they could outgrow the rank vegetation of the tropics, and prevent the growth of most of the other large trees in the forests; but india-rubber gatherers have destroyed most of them, and I imagine that there is a comparatively small number left.

I have always thought that the production of india-rubber would before long cease to be sufficient to supply the demand, and that, therefore, the value of that article would increase with the lapse of time. Now it is to be expected that the enormous expansion during the last few years of the cycle-tire, electrical motor-car, cab, and kindred industries will lead to the bestowal of increased attention on

the world's rubber supply, which is so intimately associated with the existence of these industries.

Thinking that a plantation of india-rubber trees would be very remunerative, I devoted considerable attention to that subject, and in 1872 started one of 100,000 trees in a place admirably located for the purpose, bordering on the Pacific Ocean and between two large rivers, in the same district of Soconusco. In an article published in 1872, under the title "India-Rubber Culture in Mexico," I compiled all the information on the subject that I could obtain, supplementing it with the experience that I had acquired. Unfortunately, for reasons of a political nature, I had to abandon that plantation, and when the trees that I had planted grew large enough to yield rubber, they were tapped by the natives and entirely destroyed, but my work gave me an experience which I considered of great value. For further information on this subject I refer the reader to the above mentioned article.

The india-rubber trees that grow in Mexico are not the *Haavea guianensis* that grows in Brazil, but the *Castilloa elastica*, and if we have any of the *Haavea guianensis* I have not seen them.

Enough has been written lately on rubber cultivation to show that the profits, in Mexico at least, would be very great; indeed, 300 per cent. on the capital invested is a possible return, after five years, from cultivating *Castilloa elastica* in that Republic. This is a return which provides plenty of margin for contingencies. Rubber-growing is no longer in the experimental stage, as witness the plantation of La Esmeralda, in Oaxaca, to which further reference is made below. Cultivated india-rubber plantations are few, for the reason that, in some degree like the coffee plant, the india-rubber tree requires a long period of continuous cultivation before making any return to the cultivator. Mexico affords excellent opportunities for the development of this admittedly profitable industry. On this point the authority of Sir Henry Nevil Dering, the British Minister to Mexico, who, in a recent report to the Foreign Office on the cultivation of india-rubber, says: "The regions most favorable for the growth of this important, yet rarely cultivated, india-rubber tree are the plains of Pochutla, Oaxaca, and also along the banks of the Copalita River where the tree is found in astonishing numbers. Few are the plantations of india-rubber trees existing in the Republic of Mexico. The principal one is La Esmeralda, in Juquila, Oaxaca, which has over 200,000 trees, eight years old." According to the same report the total expense for five years' cultivation of a "rubber plantation of 100,000 trees will not exceed \$25,000 in silver and the yield of 100,000 trees at the first year's harvest will bring the planter \$120,000, besides the product obtained from the corn, vanilla beans, cacao, and bananas raised from side planting. The net profit on the investment, after de-

ducting the entire cost of the land and all expenses up to the first year of harvesting, will be \$95,000, and each of the succeeding harvests, for twenty-five or thirty years, will bring a steady income of over \$100,000." This is 400 per cent. per annum net profit on the investment. These calculations are based upon the production of a five-year-old tree, but the report adds that "this product will be gradually increased every year for the next four or five years."

Cotton.—We have many regions in Mexico very favorably located for the cultivation of cotton. I am aware that the cotton-growers of the United States hold that what they call their cotton belt has peculiar conditions for the production of their staple, which, in their opinion, do not exist in any other portion of the globe, and they believe, therefore, that nobody can compete with them in this regard. Without any intention of depreciating the advantages of the cotton belt of this country, I am of the opinion that there are in Mexico lands as well adapted for the production of cotton as the best in this country, and in some regions perhaps better; yet, notwithstanding these advantages, and although our wages are low, cotton is produced cheaper in the United States, and is sold with profit by the planters for one-half the price that it commands in Mexico. So great is the difference in the price of this staple in the two countries that, notwithstanding an import duty on cotton of eight cents per kilogram, or almost five cents per pound, which is equivalent to fifty cents ad valorem, we import from this country a very large portion of the cotton we manufacture. I do not overlook the fact that cotton is raised here by negro labor, which is considerably cheaper than white labor, but, even assuming that wages in this case be the same in both countries, the difference in cost is so great that some other factor besides labor must enter into the expense of production.

As our cotton manufactories are increasing, more especially because of the protection afforded to home products by the depreciation of silver, we now produce only about one half of the cotton we manufacture, and have to import the other half from the United States; but I am sure that before long we shall not only produce enough for our own consumption but also for export.

Agave.—The whole central plateau abounds in many species of agave, which are used for several purposes. In the eastern portion of the plateau, that is, from the City of Mexico towards Veracruz, in the region called the Plains of Apam, the agave yields a large quantity of a white juice, similar in appearance to milk, which when fermented is used as a tonic, and is an intoxicating beverage. The amount of alcohol it contains is small—about 7 per cent., I believe—but imbibed in large quantities it is quite intoxicating. The use of this beverage, called pulque, has become very extensive in Mexico, and it must have

very superior qualities both as a tonic and nutritive, when many live on nothing but corn and pulque. In the mining districts, where a great deal of nervous force is expended working in a high temperature and under very unhealthy atmospheric conditions, this drink is almost indispensable, and I imagine that when a way is discovered to keep it for some time, and its medicinal qualities become better known, it will be exported in considerable quantities and used by foreign countries. From the agave of other districts a drink is made called mescal, which has some remarkable therapeutic properties, the most celebrated being made in a district of the State of Jalisco called Tequila, from which it takes its name; and in the very dry and stony regions of Yucatan another species of agave grows, which seems to derive its food wholly from the atmosphere, yielding a very good fibre, much like manilla, which we now export in large quantities, particularly to New York. All the agave yields a first-class fibre as raw material, either for paper or cordage—some of it being rather coarse, like the Yucatan henequen, and some of it almost as fine and glossy as silk, like pita.

Henequen.—By far the most important of our fibre industries is the cultivation and preparation of the fibre known as “Sisal hemp,” so called from the name of the port from which it used to be principally exported, and in the United States as “henequen hemp.” The plant which produces it is a species of agave which flourishes to best advantage in stony and arid land at the level of the sea. The present prosperity of the state of Yucatan, a large proportion of which is too sterile to yield any other crop, is due almost entirely to the development of this industry. The plant requires very little cultivation, and the separation and cleaning of the fibre is effected very cheaply. The yield of fibre is estimated at the rate of 1000 to 1200 pounds per acre.

Pulque.—The pulque plant is indigenous to Mexico, often growing wild on the uplands, where for months and years at a time no rain falls; and it is also largely cultivated on the Plains of Apam, a large tract of land lying in the States of Mexico, Puebla, and Hidalgo, about sixty miles east of the City of Mexico. The plants are transplanted when two or three years old with much care, then cultivated in fields especially prepared for the purpose, each acre containing from 360 to 680 plants.

Nature requires the plant to be milked, when the liquor is ready to flow, for the use of man, else the superfluity of juices will cause the growth of a thick stem from the centre of the plant, which shoots up some ten or fifteen feet, putting out branches at the top, with clusters of yellowish flowers. These branches are symmetrical, and the effect is like a lofty, branched candlestick.

When the pulque is first extracted, before the process of fermentation sets in, it is sweet and scentless, and in this state is preferred by

those unaccustomed to the drink. The fermentation takes place in tubs constructed for the purpose, and to aid or expedite the process a little "madre pulque," or pulque mother, is added, which hastens the chemical change. At times fermentation is retarded by a cold spell at the vats. When the laborer draws the sweet sap with his rude siphon, made either of a gourd or a calabash and a hollow horn tip, he discharges the contents into a pig- or goat-skin swinging at his back. The "agua miel" in this stage is like a green water in appearance and taste. Soon carbonic acid is formed, and it becomes milky, and resembles in taste very good cider. The amount of carbonic acid contained is so great, and the decomposition so incredibly rapid, that in a few hours it would become vinegar if not closely watched. To prevent this the pulque dulce, or sweet pulque, is poured into a tinacal—an oxhide strapped to a square wooden frame, and capable of holding a considerable amount of the liquid. These tinacals are of various sizes, to meet the emergencies of the situation.

To the sweet pulque is added an equal proportion of milk, and then a slight dose of infusion of rennet. This is not enough to coagulate it, but sufficient to induce a slight amount of putrescence, as in cheese. The putrid odor and flavor of pulque as sold in the pulque shops is due to the rennet alone, for the belief that this is caused by the flavor of the pigskin, in which it is brought to market, is without foundation.

From the tinacal it is poured into a hogshhead by means of pigskins, and it is transferred to the barrels of venders from the hogshheads of the "haciendado" by means of the same skins.

The plants are wholly independent of rain and storm, and are of a beautiful deep-green color. The pulque is carried every day to the City of Mexico, by special trains, in "barricas," or large tierces, and by "cueros de pulque," or pigskins filled with the liquid.

The plant does not arrive at maturity or yield its sap before its eighth year. During the growth of the plant a central bulb is formed for its coming juices. This is scooped out, leaving a cavity or hole large enough to hold a few quarts. This cavity is made in the bottom and middle of the plant. The juice exudes into this cavity and is taken out daily by being sucked into a long-necked gourd on the siphon principle, by the Indian laborers, and then poured into the tubs taken to the fields and then removed to the vats.

The outlay on each plant up to maturity is calculated generally at about \$2, and the return is from \$7 to \$10, according to the size of the plant. Its period of production is about five months, and each plant supposed to yield from 125 to 160 gallons of liquid during that time.

The principal regions for the cultivation of the maguey are the arid limestone chains of hills, and here, in many places, the hole for the

reception of the young plant is made with a sort of crowbar with a sharp point, used principally in the quarrying of tepatate, the chief building material of the Mexican capital. It is usual to aid the young plant by putting some good soil into the hole. These young plants are suckers which the mature maguey throws out on all sides, and which have to be removed before the heart is tapped for the sweet sap, which is the "agua miel," or honey water, of the pulque.

The leaves of the pulque plant are long and pointed, with prickles along the edges. Sometimes these leaves are very large, and the bunches of them springing from the common stalk are enormous. The bruised leaves are made into a kind of paper—a rather tough, stiff, and hard paper—and they are also used in their natural state as a thatch for the roofs of the common huts or houses occupied by the peons. A kind of thread is also made from the fibrous texture of the leaves. A rough needle and pin are made from the thorn, and from the root a cheap and palatable food is made.

Cactus.—Mexico is often called "the land of the cactus," and the multitudinous development of cactus forms in that country cannot be appreciated by any one who has not seen them in their home in the hot land. There is a species known as the giant or candelabra cactus, which has a single stem, from which spring innumerable branches, the whole plant resembling an immense candelabrum. I have seen in Oaxaca, some candelabra cacti about twenty feet in height by thirty in diameter. Some cacti shoot in single, column-like stems, others run like leafless vines, and others resemble needle cushions stuck full of needles.

Cocoa.—Cocoa is produced in several localities. That of Soconusco, in the State of Chiapas, is of so excellent a quality that when Mexico was a colony of Spain it was the only kind used by the Spanish royal family. On account of the expense and difficulty of transportation, and the cultivation of cheaper quality in other localities, the production has dwindled down to an insignificant amount, and now hardly enough is grown to supply the demand in that district; but it is universally acknowledged that the Soconusco cocoa is the best in the world.

The best elevation for cocoa is from 300 to 1000 feet, and the tree seldom thrives well at an altitude exceeding 3000 feet. Warmth and moisture are necessary for the successful cultivation of this plant.

The State of Tabasco produces a very good quality of cocoa, although it cannot be compared with that of Soconusco. In other places it grows very well also, but for various reasons the production, instead of being developed, has dwindled down until it is not enough for home consumption, and we have to import some, especially from Venezuela and Ecuador. One disadvantage of the cocoa industry is

that the tree requires several years to reach maturity and to bear fruit, and few investors can afford to wait the necessary time.

Vanilla.—The vanilla bean grows very luxuriantly on the Gulf coast of Mexico, and it has been for some time a very profitable production, especially in the counties of Papamtlá and Misantla, in the State of Veracruz, on account of the excellent quality of the bean and the high price which it brings. It grows in a region which is subject to intermittent and remittent fevers, and sometimes yellow fever, and where labor is very scarce; for these reasons it has not attained a greater development. I hardly think there is any locality where the vanilla vine grows better than in Mexico.

Vanilla requires a hot, moist climate, and, therefore, the lowlands are best suited for its culture. Very little of the vanilla produced in Mexico is at present grown at an elevation exceeding 1000 feet. At the same time it is claimed that in some places it thrives up to 3000 feet.

The vines will usually produce considerable vanilla in the third year, and they will yield considerably more during the fourth, fifth, sixth, and seventh years, and the production then begins to decrease. But before this time new rootlets have been dropped from the old plants, which form new vines that take the place of the old ones; thus the plantation is kept in a state of continued production. The central portion of the Isthmus of Tehuantepec is one of the most suitable regions for its cultivation, as much wild vanilla is found growing in the forests there.

The Mexican vanilla dealers have established five grades, namely: First, vanilla "fina," or legal, the beans and pods of six and a half inches long, or upwards, short in the neck, sound and black, and the beans which become split or open, provided they have the foregoing qualities and the split does not extend more than a third of the pod. This class is again divided into "terciada," which is composed of the shortest pods; "primera chica," "primera grande," "marca menor," and "marca mayor," the largest of all. Second, "vanilla chica," those pods which differ from the "terciada" only in being shorter, two of them counting as one of the first class. Third, vanilla "zacate," the pods of all sizes, which are off color through being gathered before becoming properly ripe, or being over-cured; "pescozuda," "vana," "cueruda," and "apocoyonada," names for pods in a more or less damaged condition. Fourth, vanilla "cimarrona," the wild vanilla in good or fair condition, three pods counting as one of the first class. Fifth, the "rezacate," composed of the very short pods; of those split all the way up to the stalk, of the badly damaged, of the very immature, and of the greatly over-cured; of this, six pods count as one of the first class.

After the sizing and classification are finished, the pods are tied up in bunches of 100-150, so as to weigh one pound, and wrapped in filtering paper and tin foil.

Silk Culture.—The mulberry-tree and silkworm industries have a very great future in Mexico, and are destined to produce a veritable revolution in the industries of the central plateau of that country. The mulberry tree can be grown in Mexico almost to an unlimited extent, especially in the central plateau, and, as wages are low, the raw silk can be manufactured at a great profit. Several experiments have been made on a small scale, more particularly in the Valley of Mexico, by Mr. Hipolito Chabon, a gentleman of French descent, and he has obtained most satisfactory results. I have no doubt that the time is not far distant when the silk industry will assume great proportions in Mexico, and we will be able to stand among the foremost silk-producing countries of the world.

Cochineal.—The cochineal is a bug which feeds on the cactus ; and which, when fully developed, is brushed off the cactus leaves and roasted to prevent decomposition, being then ready for market. It is raised to great advantage in Mexico, and especially in the valleys of the State of Oaxaca. When it was the only article used to dye red it was very valuable, commanding sometimes between four and five dollars per pound, and it made the wealth of that State. But recent discoveries in chemistry have supplied other substances for dyeing which are very cheap, especially aniline, and the price of cochineal has fallen considerably, so that now it is hardly raised at all. When it had a high price, it was raised in Guatemala, and it was the beginning of the wealth of that State. It is now raised, I understand, in several other countries.

Rice.—Rice grows very well in Mexico, and I have not seen any district where it is necessary to inundate the fields to favor its production, although I understand it is also raised in that way in some localities. It is generally planted just as wheat and barley are in the United States, needing no irrigation and depending entirely on the rainfall. I imagine that raising rice by inundation would be more expensive, and also be dangerous, because it could not fail to affect the salubrity of the country.

Chicle, or Chewing-Gum.—This article, like many others, grows wild in Mexico, where the demand that has arisen for it in the United States has begun to develop its production. For some time past the shipments from Mexico have been on an increasing scale, owing, no doubt, to the comparatively high prices which ruled early in 1896.

Every year a larger extent of forests is worked for chicle, resulting in a steady growth of the production since the gum first became an important commercial article, about ten years ago. Prior to that

time 7 or 8 cents a pound was considered a good price, and in 1896 it was sold at 36 cents. The importation into the United States constitutes almost the entire production, and the amounts and values are thus officially reported by the Statistical Bureau of the United States for the fiscal years ending June 30 :

	1894.	1895-96.
Chicle	1,903,655 lib.	3,618,483 lib.
Value.....	\$490,438	\$1,167,101
Average.....	25½ cents per lib.	32 cents per lib.

The following statement has been compiled from official data collected by the Mexican Government, the value of the chewing-gum being in silver :

Year.	Pounds.	Value.
1885-86.....	929,959	\$ 156,402
1886-87.....	1,254,853	353,641
1887-88.....	1,542,794	371,673
1888-89.....	2,037,783	592,810
1889-90.....	1,827,131	714,242
1890-91.....	2,457,653	1,284,682
1891-92.....	2,494,177	703,572
1892-93.....	1,757,813	705,167
1893-94.....	2,645,722	803,019
1894-95.....	1,668,636	679,367
1895-96.....	3,297,371	1,527,838
Total.....	21,913,932	\$7,892,413

Yuca.—Yuca, or starch-plant, called manioc in South America, is a bush from four to six feet high, having tubers, like horse-radish, six to ten to every plant, and weighing from one to twelve pounds each. It is an important product of Chiapas and may be sown at any time, but it is better to do so from the stems when the rains begin, say in the month of May, by opening ditches five feet apart, and planting the cuttings, eight inches long, in them consecutively, leaving one foot between. Vegetable and sandy soil is best adapted for it, although it can be planted and will thrive in any kind of land. In arid and hard soil it needs plowing. If the land has been thoroughly cleared before planting it requires but little weeding during cultivation. A year after being sown, if the soil is rich, it will begin to yield tubers which must be dug up at the time the tree begins to flower. In replanting after digging the tubers, a slip is left standing and this will bear in twelve months. Besides extracting the starch from the tubers, the leaves are used as fodder for stock.

Sir Henry Dering, the British Minister to Mexico, sent recently to the Foreign Office some practical notes on the cultivation in Mexico of the "Yuca" or cassava plant, pineapple, ginger, "chicle" or chewing-

gum, sarsaparilla, jalap, licorice, canaigre, and ramie, and I shall quote here from his notes on some of those products.

The yuca is to the peon, in the tropical section of the Republic, what potatoes are to the poor and working people of Ireland. Yuca is a native of the country, and its rise dates back before the conquest of Hernan Cortez, and it has always formed a portion of the food of the ancient and present Mexicans, especially those living in Veracruz, Oaxaca, Chiapas, Tabasco, and Yucatan. It has been estimated that the returns of yuca cultivation are immense; the yield of an acre contains more nutritive matter than six times the same area of wheat.

Ginger.—Ginger is found growing wild in various parts of Mexico. The returns from an acre of land vary considerably, but when cultivated under favorable conditions, the crops ought to be 4000 pounds and upward. A ten-acre patch would yield annually from \$5000 to \$7000.

Canaigre.—Though for years canaigre has been used in Mexico, both for medicinal and tanning purposes, it has but recently attracted the attention of the outside commercial world as a valuable source of tannic acid. The result of investigations has been to create a great demand for canaigre in the tanning business of European countries, and more recently in the leather-making centres of the United States. The only supply now to be obtained of this plant is from the wild growth along the rivers and valleys of Western Texas, New Mexico, and Mexico, and a fear has been felt for some time that with the constantly increasing demand the present sources of supply must become exhausted.

Peppermint.—Water mint (*mentha vulgaris*) thrives very well on the central plateau of Mexico and in some sections of the warm zone, especially along the rivulets and small lakes. There is no reason why the peppermint (*mentha piperita*), as well as spearmint and tansy, should not grow in abundance in Mexico, as they belong to the same family and require the same climatic conditions. As the oil of peppermint is very extensively employed in medicines and the arts, the cultivation of this plant will be profitable to Mexico.

Cabinet and Dye Woods.—In the low, hot countries we have all the cabinet woods growing wild and a great many dye woods, some of which are indigenous to Mexico, like the Campechy wood, not being found in other countries. It would take too long to enumerate the different kinds of cabinet woods we have, and I will only say that it happens with them as with our fruits, that only such of them as have been introduced here, like mahogany, cedar, rosewood, ebony, and a few others, are known in this country and in Europe, while hundreds of other kinds as hard as those and of as fine, if not a finer grain, are found in the wild woods of Mexico.

Grasses.—In the lower regions of Mexico, especially at the sea-level, we have various grasses which can be grown at very little expense and which make very good food for cattle, fattening them very much, and in comparatively short time. While I lived in Soconusco, I used to buy lean cattle, three years old, at \$10 per head; and letting them pasture on the grass, the expense being little more than that of a few men to take care of the cattle, without providing them with any shelter, pens, or anything of that kind, only giving them about once a month some salt, at the end of four or five months they became very fat and could be sold on the spot at \$25 a head. The fattening grasses can be very easily cultivated, because they are of such rank growth that they do not allow any other vegetation to spring up on the same spot, and so save the expense of cleaning the ground of weeds; which, in the hot regions is very great, as vegetation is there very rank.

Alfalfa.—The alfalfa grows very luxuriantly in almost every place in Mexico, and it is so abundant there, that it has very little commercial value. It is nowhere dried and kept for fodder, but of course such use can be made of it. Land good for alfalfa has a very low price, and we are greatly surprised when we hear that in California the alfalfa land is worth \$100 an acre.

Cattle Raising.—Mexico has special advantages for the raising of cattle, not only because of its mild climate, which renders unnecessary the many expenses required in the northern section of this continent, but also on account of the grasses that grow in several localities and that constitute very good food for cattle, as I have just stated.

Mexico will be, before long, a very large producer of cattle and other animals, and they will form a large share of her exports. Mexico has sent within two years about 400,000 small undeveloped cattle to the United States at about \$15, Mexican silver, per head, and has also sent nearly her entire output of cotton-seed meal to the United States and Europe at about \$16, silver, per ton. The meal sent to the United States is fed to cattle. The Mexican cattle sent there take the place of the better stock which is sent to Europe, causing virtually a five-thousand-kilometre railway haul against the short haul in Mexico to reach the coast. In addition we have to pay import duties in the United States. This is a sufficient evidence that a large profit could be made by fattening cattle with the cotton-seed meal in Mexico, and shipping the fattened cattle direct to Europe, even using the best cattle of the country. But rapid improvement should be made in the class of cattle for beef purposes. Cotton-seed meal is the feed to be relied on chiefly. The quantity of it produced already is sufficient to fatten a large number of stock. The cattle should also be fed with a small amount of corn along with the meal during the last month of feeding to harden and whiten the meat, as feeding only with cotton-seed meal makes the



meat dark, and militates against its selling value to some extent, and the corn can be easily and profitably supplied. The total cost of fattening a steer should not reach \$15 silver. There is an unlimited demand in Europe for choice meats at about 12c., gold, per pound, and no import duties have to be paid. Poor classes of meat are a drug in all markets of the world. With these great advantages placed within easy reach, the producers in Mexico of grain and stock have a guarantee of ready sale at good prices for all they can produce.

Inquiry was made in Liverpool about the possibilities of the Mexican live-animal trade with England, and it was found that the initial difficulty is the small size of the Mexican cattle, as cattle weighing 1200 pounds are considered small by the trade there, and from 900 to 1000 pounds is therefore extremely small. The smallest Texan cattle ever imported in Liverpool averaged 1226 pounds.

The best Mexican steers can be made to weigh 1200 pounds if well fattened. The difference in cost of transportation on account of lighter weight is but small in proportion to the cheapness of Mexican cattle. Cattle breeders in Mexico, on the whole, have not advanced much in developing good breeds of cattle. They do not appreciate their value, nor would they pay one-half their actual cost, though they can be had from the United States at half of what they would cost from Europe. Herefords are the best breed. I am sure that the railroads will do all they can to encourage that industry by charging as low rates as possible, as they would thus develop an industry which in the course of time would become very profitable to them.

A great need of Mexico is a reliable supply of good and healthy water through artificial means, well distributed over the stock ranges to prevent the great loss by death through lack of water, as well as the heavy shrinkage of meat and tallow, by so much unnecessary travelling of stock to water. They cannot grow fairly, much less fatten, and over one-half the annual increase die of exhaustion, while the value of the stock lost in one year would supply permanent water at convenient distances and prevent three-fourths of the loss and shrinkage now sustained. It has been amply proved that stock water can be secured under the most unfavorable conditions.

It would be to the advantage of the breeder to import some English short-horn bulls, with the object of breeding larger cattle, so as to make profitable the export of cattle to England, as animals should weigh from 1200 to 1300 pounds. This has been done in Texas and in the Argentine with beneficial results, and the improvement in the cattle from the latter place has been most marked during the last five years. With the proper attention, the same good results could be achieved in Mexico.

The English steamers that bring a large quantity of merchandise

to Mexican ports have trouble in even securing ballast to get out of those ports, and have to traverse the Gulf and United States coasts to secure loads for the return trip. Their owners are willing and ready to supply facilities for the exportation of live stock and frozen meats if assured of a sufficient traffic to justify them in the expense, for they prefer reloading direct for Europe to going elsewhere for freight. The time required to return direct from Mexican ports is but little more than from New York and Baltimore, and is sufficiently short to warrant good service in transportation of live stock, and the cost would practically be the same as from United States ports. The United States is beginning to export beef and stock from Galveston to Europe, which is practically the same distance as from the Gulf ports of Mexico.

Mexico could export annually and easily after the next ten years 400,000 of fattened cattle, which would increase considerably the amount of our exports, and this trade would greatly assist the development of many other industries.

The desired result in question could be hastened by mixing good foreign labor with the native labor. The latter would be better fed, clothed, and educated, as well as encouraged, taught, and compelled to do better work, and thus the country's physical and mental welfare would be greatly promoted.

Sheep.—The same conditions apply to the sheep and wool industry. It is a great mistake for the Mexican sheep-owners to raise a class of sheep that yield each only from one to two and one-half pounds of very coarse and inferior wool, annually, while they themselves wear goods manufactured from foreign wools, and the domestic-cloth manufacturers are also under the necessity of importing largely of fine wools. Mexico possesses natural resources for producing all the wools of every grade that she needs, with a large quantity over for export, not to speak of choice grain-fed mutton for domestic and foreign consumption.

The custom of killing so much poor stock is a terrible waste of resources, as one well-fattened animal will render twice as much as a thin or poor one.

Products of Cold and Temperate Regions.—I will not speak of the products of the cold and temperate regions of Mexico, such as Indian corn, wheat, oats, barley, and others, because their cultivation is well understood in the United States, and I could say here nothing new to the American reader, but will only state that they all grow very well in the proper regions of Mexico.

FRUITS.

We produce in Mexico a great many tropical fruits that are not sent to the United States because there is no market for them for the reason that they are not known here. Some of them are delicious,

and with the facilities of communication, I have no doubt that they will become known and a taste will be developed for them in this country. I will speak here only of such of our tropical fruits as come to the United States.

The advantage of tropical fruits growing in their proper zone and climate is immense, as the expense of planting and cultivating them outside of their proper limits is very great and there is always danger of their destruction.

Oranges.—Orange trees, like any other fruit trees, depend in Mexico on the rain, and, except in a private garden or private grounds, are not irrigated. While the orange tree is a hardy plant, it thrives best and yields the most luscious fruit in the tropics. Elevation exceeding 2500 feet is not, as a rule, desirable for orange culture.

The advantages of irrigation in orange culture are great in the sub-tropical regions of Mexico. The fruit of the irrigated orange tree is of a very superior quality, while the tree itself has a longer lease of life and is less subject to attacks from insects and diseases of a fungoid nature. One of the conditions primarily requisite to the growing of a marketable orange is that the trees be watered at judiciously regulated intervals during and for a short time after the blossoming season. Attacks from insect and fungoidal pests, which are most disastrous, and to which the trees are peculiarly subject during the blossoming period, are rendered even more dangerous by the prevalence of a considerable amount of humidity in the atmosphere which is always conducive to the development of parasitic germs or fungoidal spores. An abundance of moisture in the ground but a comparatively small amount in the air is the condition most to be desired during and just after the blossoming season. This is to be had by irrigation, but, generally speaking, not without it. Under irrigation, the soil is also much less subject to deterioration, owing to the superior fertilizing properties of water taken from wells and streams. Rain water, aside from containing a small percentage of ammonia, which it receives from the air, only acts as a medium to transmit the nutriment from the soil to the tree, while water taken from wells or streams holds in solution the renewing materials which are directly communicated to the plant proper.

In the more elevated orange districts of Mexico, the trees should be watered about once every twenty days during the dry season.

In some places our oranges are as sweet as if they had been preserved in sugar, and this, notwithstanding the fact that no attention is paid to their cultivation, that they grow almost wild, and without irrigation.

I think that the distillation of orange blossoms would prove very profitable. The production of flowers per tree is given at from 22 to 55 pounds in the case of sweet oranges, and from 60 to 100 pounds per tree from the bitter variety.

In flavor and productiveness the Mexican orange is unsurpassed. In the majority of the districts but little care or attention is given to the cultivation of the trees. Scientific orange culture in Mexico is practically unknown. The introduction from other countries of different varieties of the plant for experimental purposes is just being commenced.

The price of oranges in Mexico at the present time, in districts reasonably near lines of transportation, is about \$11 per thousand, Mexican money, on the tree. It is the practice of the producer to sell the fruit on the trees, the buyer picking, packing, and shipping it at his own expense.

About one hundred trees are usually set out to the acre, the average yield being from 800 to 1000 oranges to the tree. I know of trees in Mexico which have a record of having produced 10,000 oranges. This, however, is very exceptional.

A properly cultivated and prudently managed grove at the end of five years' growth should prove as profitably as a coffee plantation of the same size, at the end of five years.

The production of the orange trees begins in the third or fourth year and increases up to the twelfth, and, in some cases, to the fifteenth or sixteenth year. It is considered best to cut the fruit up to the fifth year, not permitting it to mature.

A book prepared by Frederico Atristain, entitled *Cultivo y explotacion de Naranja*, and published by the Department of Fomento of the Mexican Government, contains a great deal of reliable information on the subject of orange culture in Mexico.

After an orange tree has been yielding sweet oranges for many years, it very likely exhausts the substances of the earth which give the sweet taste to the fruit, and it begins to lose its sweetness, until finally, if the land is not manured, as is almost always the case in Mexico, the oranges become bitter.

A recent cyclone, which lowered considerably the temperature in Florida, destroyed in one day, I understand, about 12,000,000 orange trees, thus causing ruin or serious loss to thousands of men engaged in that large industry, while the orange region in Mexico is entirely free from frosts and consequently from such dangers.

Lemons.—In the hot and temperate regions of Mexico lemons grow very well. There are some districts of the country, like Soconusco, where the natives plant the lemon trees very close together, for the purpose of making a hedge or fence, and, notwithstanding that the trees have not the necessary conditions of sunlight and air for their proper development, they grow very well. I do not know of any place in Mexico where lemons have been cultivated for commercial purposes; but I am sure they could be made a very lucrative industry.

Limes and Shaddocks.—Lime trees prosper very well in Mexico, bearing large amounts of delicious fruit. I have not seen in the United States any of our limes, at least such as are imported here are not like ours, and I have no doubt that if known our limes would find a good market in this country. The lime should not be planted at an altitude exceeding 1000 feet. We grow also a very large kind of shaddock, which we call "toronja," and which is not imported in this country, but which if known here would find a good demand. It grows very luxuriantly and attains at times a very large size, even eight inches in diameter, having a very thick peel.

Bananas.—The banana thrives anywhere from the sea-level to an elevation of 5000 feet, and is one of the many Mexican fruits which yield to the planter an immense profit. The whole Mexican coast produces the banana spontaneously and in very great abundance. On the lands near the sea, at an elevation of 600 to 700 feet, large plantations of bananas can be started at a cost of five cents per plant, including all expenses. At the end of the first year, the plants begin to bear, and 1000 plants, which have cost \$50, will produce \$1000 as a minimum. The following year the yield is double that amount, and almost without expense. At the end of one year, the plant produces one bunch which is worth in the United States from 75 cents to \$1 gold, the cost to the farmer being not more than 25 cents per bunch in Mexican currency. After the first year, the sprouts from the old plant grow up and give double the first year's yield.

There is perhaps no tropical plant easier of cultivation than the banana. The suckers having been planted out at the commencement of the rainy season, they will grow vigorously, and produce fruit in about a year. The land must be kept free from weeds, and an occasional turning up of the soil will prove beneficial. Before the plant throws out its flowering stem, suckers will make their appearance above the ground, and these will require careful attention. While the plant is young, all the suckers except one should be cut away, the best plan being to sever them with a sharp spade. Thus all the vigor of the plant is thrown into the fruiting of the first stem, and the growth of the one to supplant it, and, in this way, fine large bunches can be reckoned on. The second stem usually produces a finer bunch of fruit than the first, but, as the land becomes exhausted, the bunches of course decrease in size, and this shows the necessity for manure in some form or other.

Bananas are used extensively as shade for young coffee and cocoa trees, and in places where an export banana trade has been established, the formation of a cocoa plantation is a very inexpensive matter, as the return in fruit from the bananas will pay for the cultivation of the cocoa until the trees are able to give a small crop.

The important feature, and the one upon which the success and profit of the industry depend largely, is that of cheap and certain transportation facilities. That requisite is easily obtainable ; for instance, there are extensive and cheap lands for sale along the Tampico branch of the Mexican Central Railroad, from which the fruit can be shipped either all by rail, or by rail to Tampico, and thence by boat.

We have many kinds of bananas in Mexico, of different sizes, colors, and flavors, ranging in length from two to eighteen inches, and from one-half of an inch to three inches in diameter. The largest, which in some places are thought unfit for food, are in others, like Soconusco, considered the best ; very likely on account of their different quality. When roasted the latter are very juicy, and taste exactly as if they had been preserved in sugar. Some people on the coast live almost entirely on bananas, this fruit forming their principal food. The banana is likewise a tropical plant, and thrives best on the lowlands.

Pineapple.—The Toltecs and Aztecs knew how to cultivate the pineapple, and when the Spaniards conquered Mexico, they found the fruit in the markets of the towns on their way from Veracruz to the great Tenochtitlan. "From time immemorial," Sir Henry Dering says, "the pineapple has been cultivated in Amatlan, a town five miles south of Cordoba, from where the ancient Mexicans used to get their main supply." Now it is grown in tropical Hidalgo, Puebla, Veracruz, Tabasco, Chiapas, Oaxaca, Morelos, Guerrero, Michoacan, Colima, Jalisco, and Tepic. "Besides the fruit being very delicious and wholesome," Sir Henry Dering says, "a fine wine and vinegar are made of the juice. The leaf furnishes a fibre of extraordinary strength and fineness, making it even more valuable than the fruit. The fibre is made into ropes, cables, binding twine, thread, mats, bagging, hammocks, and paper. A pineapple rope three and a half inches thick can support nearly three tons. A textile fabric as fine and beautiful as silk is made of this fibre too. It is believed that the fine cloth of various colors used by the upper classes among the Aztecs was made of the pineapple fibre. The modern Mexicans do not manufacture it much now, except in the Isthmus, where the Zapotec Indians still make a cloth from it and from wild silk. One cause for its disuse is the slow and wasteful manner in which it is separated." Pineapples will grow at elevations of from 2000 to 3000 feet above the level of the sea, but the best and most delicate fruit is produced on the lowlands.

Cocoa-Nut.—We have in our lowlands near the sea many kinds of palms called corozo, bearing different kinds of fruit, growing in large bunches and the fruit very abundant, being in the shape of a small egg, very rich in oils, and making also a very good food, although it is hardly used now for any purpose. The palm tree bearing the cocoa-nut grows, of course, very luxuriantly, and does not require any care after

it is once planted. The cocoa-nut prefers the sea-coast and high temperature. The saline breezes from the sea are very beneficial to it. I have not seen in Mexico the species of palm bearing the date, perhaps because it has not been planted there ; but I am sure that we could raise it, as we have several sections with a climate similar to that of Egypt and Asia Minor, where the date palm grows so well.

Mangos.—The mango is a very fine fruit, but requires a cultivated taste, and is generally disliked the first time it is eaten. It has a very large bone, although that is not the case in fine qualities, called Manilla mango, which has a very thin one and a great deal of pulp. The mango occasionally comes to the United States, but being a very frail fruit, has to be taken from the tree when very green. It does not ripen well, and, if taken when beginning to ripen, it reaches its destination in a decayed condition.

Alligator Pear.—The alligator pear is one of the most delicious fruits that we raise in Mexico, and is properly called vegetable butter, being a good substitute for butter. It is not eaten by itself ; the most usual way to eat it is in salad. We have several kinds and sizes of this fruit. The seed of the alligator pear is oval-shaped and quite large, about 4 inches in length by $1\frac{1}{2}$ in diameter, and of some oily substance, which, I have no doubt, has some good medicinal properties.

Mamey.—The same is the case with the seed of the mamey, a fruit unknown in the United States, having a red pulp, and a very large seed covered with a thin shell. The Indian women extract an oil from that seed and use it for their hair, and I think it must have many more useful medicinal properties.

A great many other of our fruits have seeds containing substances which I have no doubt will be found, when analyzed, to be very valuable to therapeutics.

Zapote.—The zapote is one of our tropical fruits which does not come to this country. I have just heard that the seeds of the zapote have recently been found by a Mexican doctor to be a very good narcotic, which does not produce the ill effects of the drugs now in use.

Papaya.—This fruit, which grows in our hot lands resembles the melon in shape, pulp, and seeds, but its color is of a yellowish-red. It was considered a very common fruit, but recently it was found to be a powerful digestive, and it is already used in Europe as a medicine under the name of Papaine.

Flowers.

Mexico is a favored country for flowers. They grow wild in a great many places, and they can be raised at very little cost, as there is no need of hot-houses or any other expensive appliance to cultivate them. The Indians in the small towns around the City of Mexico

make a business of raising flowers, and they sell handsome bouquets, as artistically made as any in this country, for a mere trifle. A bouquet which, for instance, in New York would cost \$5 in winter, could be had in the City of Mexico all the year round for 25 cents; and I look forward to the time when flowers will be exported in large quantities from Mexico to the United States if the protective policy of the country does not interfere.

IRRIGATION.

At the time of the Spanish invasion of Mexico, the Indians in those parts of the country where the population was greatest were dependent upon irrigation for a large part of their cereals, and for cotton, which played so important a part in their economy. As the same method had been employed from time immemorial in Spain, it followed that on the partition of the soil among the Spanish conquerors, irrigation became an important factor in their agriculture; but with expansion of population large tracts of land have come to depend entirely upon the rain.

In recent years Mexican agriculture has depended almost altogether on the rainfall, except in a few places well supplied with water, and where irrigation is both cheap and easy; but the inhabited portions of the country have been depleted of their timber by the natives for the purpose of using the wood for fuel or lumber. In more recent years, the building of railroads has increased considerably the demand for wood both for sleepers and for fuel for locomotives, and the consequence is that a great change is taking place in the climatic conditions of the country and that fuel is exceedingly high. In no other country is there so much timber—a good deal of it not yet full grown—consumed annually as in Mexico. The consumption of timber for railroad purposes alone, not to mention that used in mines, smelters, and as fuel in cities and towns, is incalculable.

Competent authority in Mexico, among whom is the Inspector of Manufactories, created for the purpose of insuring the collection of the internal-revenue tax, considers that only in the Federal District of Mexico the consumption of wood exceeds 4000 English cords daily, used as fuel in the factories, railroads, and other plants of that city.

The consumption of charcoal by private families in the old-style open cooking grates is at least 500,000 pounds in the Federal District of Mexico, which is equivalent to 2,500,000 pounds of wood taken from the scanty forests of the central plateau, and that consumption would be very much reduced if, instead of those old-fashioned grates, iron cooking stoves should be used; and to encourage their use, when I was last in the Treasury Department of Mexico, I was instrumental in reducing considerably the duties on the same.

Another cause of the destruction of the forest in Mexico consists

in the primitive way in which the Indians raise their crops. They own in common a large tract of land, and they begin to till near their towns, commencing by destroying the forests and planting every year in a different locality, because, more especially in the lowlands, the vegetation springs up so rank after the first year's crop that it is very difficult to keep the ground clear of weeds. In this way they clear new land every year, going farther and farther from their town, until sometimes their crops are raised at a distance of as much as thirty or forty miles from their homes. The natural result is the destruction of the forests around the towns and at some considerable distance from the same, and consequently the diminution of the rainfall. I was greatly struck, on my last visit to Mexico, in 1896, by the scantiness of water at an Indian town called San Bernardino, in the sierra district, about five miles north of Teotitlan, the county seat of the district, which I had visited in November, 1855, and found then exceedingly abundant in rainfall and consequently in water, as well as all the mountains north of that place, which extend for about eighty miles to the lowlands on the Gulf of Mexico. On my recent visit, however, I found a great scarcity of water: a small stream of probably not more than one-half an inch in diameter, carried in very primitive wooden troughs, was all the water the town had, and that only during the rainy season, the people being obliged to go a considerable distance for water in the dry season; this being only one illustration of what the destruction of the woods is doing in Mexico.

The city of Oaxaca, at the foot of the Sierra, used to be, in my young days, very well supplied with water, using for that purpose several streams coming from the mountains; but during the last dry season the scarcity of water has been such as to cause a real water famine.

The diminution of the rains, together with other atmospheric phenomena, which takes place from time to time, produces in some years drought that prevents the crops from being raised; as the country produces at present only the corn necessary for its consumption, which cannot be kept from year to year on account of its being eaten by insects. This diminution was very disastrous before the railroad era, causing serious famines. Since the railways were built, we import in such years corn from the United States, spending several millions of dollars in providing ourselves with that staple. All that will be changed, and we shall be able to produce cereals enough not only for home consumption, but even for export, when we begin to use irrigation. The configuration of the country allows dams that will retain sufficient water both for irrigation and manufacturing purposes, to be built at comparatively little expense.

Large tracts of land in Western Asia, Northern Africa, and Southern Europe—countries which, according to historians, were once densely

populated and gardens of the world—are now uninhabited and barren wildernesses ; and this has been brought about by the wholesale destruction of the forests and the absence of any law to protect them and provide for their replanting. In the United States it has been seen that not only does the decrease of the forest area lessen the rainfall, but also the fall of snow in the winter months, the consequence being a marked decrease in the supply of water for irrigation purposes from the streams and rivers dependent for their supply on the snowy mountain tops.

Along the Mississippi River it is a common observation of the river pilots and old steamship hands that the summers are becoming more and more dry and the streams smaller, and that the big river itself has shown a marked decrease of “ navigability ” every year during the past twenty years. All this is caused by the indiscriminate chopping down of the forests at the head of the principal tributaries of the big river. Statistics from Russia, Germany, Spain, Italy, Palestine, Australia, and India all prove beyond a doubt that the protection of the forests is a matter of vital importance.

Mexico is not only suffering from an annual decrease in rainfall, owing to the continual decrease in the timber-bearing area, the rainfall being more and more unequal every year during the past twenty years but the winters are becoming more and more severe, and the frosts are reaching farther and farther south each year. This is undoubtedly due to the wholesale destruction of timber now going on throughout that Republic.

The Government can cope with this matter only by legislation, and having before it the example of the rest of the world, the Mexican Government should act without delay and in a manner that would benefit, not only the present, but also future generations ; and I understand it has been studying the advisability of prohibiting the use of wood for the locomotives and sleepers. Experience has shown that in tropical countries iron sleepers last much longer, and are, on the whole, cheaper than wooden ones, and our supply of coal will soon be ample enough to furnish all the fuel necessary for the railway and mining industries.

One of the most profitable investments for capital in the near future will undoubtedly be the construction of reservoirs in the mountains, dams in the rivers, artesian-well boring, the erection of pumping machinery on a large scale, together with the introduction of modern devices and appliances that will facilitate the successful cultivation of the soil and assure crops of all descriptions in all parts of the country where it has been proved that irrigation must be resorted to. Not only are these requirements essential for the conservation of water for irrigation purposes, but many large cities throughout the Republic are without any certain water supply ; and many that have a sufficient supply

show by their death-rates that that supply is bad, and during the greater part of the year is the cause of wide-spread disease.

Again, much is to be gained by the use of these waters for the generating of power for the use of factories, mines, electric lighting, railways, and street cars, even should one hundred miles or more intervene between the generating plant and the machinery it is proposed to apply to it.

It seems marvellous that the Mexico of to-day—presenting, as it does, more natural resources, a greater variety of climate, cheaper labor, and better facilities for the construction of dams, reservoirs, canals, etc., than almost any other country—should be so far behind the times in a matter that has become an absolute necessity before the greater portion of its area can be thoroughly populated. The great increase in value of a piece of land after it is irrigated ought to be inducement enough for capital to be invested in such works. Competent engineers contend that Mexico, owing to its topographical and geological features, will be found to present most favorable conditions for the construction of reservoirs, dams, gravitation canals, the erection of pumping plants driven by wind, steam, gasoline, electricity, or even water power, and also for the cutting off and bringing to the surface of the underflowing waters, which are known to exist in greater abundance there than elsewhere on the face of the globe, as nature has been very prodigal to it in these respects.

Irrigation in arid countries is the corner-stone of civilization, and, to make a country self-sustaining, agriculture should be the first aim of its inhabitants. Agriculture must come first; manufacturing and mining cannot thrive until the food supply is forthcoming.

With the extension of railway lines and the notable impulse given to agricultural enterprise within the last twenty years, Mexican land-owners have improved more and more upon the earlier methods, and have, to an increasing extent, applied the principles of engineering science to the methodical cultivation of the large tracts into which their holdings are usually divided.

The Nazas Irrigation.—Some notice of an irrigation enterprise in Mexico will show how much we are now doing in this line.

The great plan of northern Mexico embraces nearly the whole of the States of Chihuahua and Coahuila, being bounded east and west by the sierras of the Pacific and Gulf coasts respectively. It consists of two watersheds,—that of the Rio Grande to the north, and the the so-called desert of the Bolson of Mapimi in the south. It is about four hundred miles wide by six hundred long, and maintains a general level of about four thousand feet above the sea, although much broken by local mountain ranges. The Bolson of Mapimi has much the same formation as the basin of the Great Salt Lake.

It receives the drainage of all the eastern slopes of the Durango sierras and the western slopes of the Coahuila ranges, but possesses no outlet. As a consequence, throughout its whole area, the rivers run into broad, shallow lakes, whence the waters are gradually lost by evaporation during the dry season. Of these rivers, the largest is the Nazas, which has a course of nearly three hundred miles from its source to where it is dispersed over the shallows, called on modern maps Lake Mayran. Sixty or seventy years ago the Nazas discharged its waters into a series of extensive lagoons, occupying what is now the fertile Laguna district of Durango and Coahuila.

At that time a phenomenal and long-continued rainfall so overcharged the, then, bed of the Nazas as to cause it to open a new course, and leave the Cayman lagoons thirty miles on one side. In the course of years these lagoons were converted into a mesquite wilderness, almost dead level, and composed of a deposit of the finest detritus, of unknown depth. The central depression of this lake-bed filled a broad valley running north and south, and surrounded by a parallelogram of mountains. The area thus comprised was about two hundred and ten square miles of pure vegetable loam, locally known as the Lake of Tlahualilo. This cuenca, or bowl, was the spot chosen about six years ago for the establishment of the great irrigation enterprise.

The problems involved called for courage and high administrative qualities, as well as technical engineering knowledge. It had early developed that the lands left dry by the changed course of the river were of extraordinary fertility, and half a century ago these tracts, immediately adjacent to the river, had been taken up and brought under irrigation after the rough methods then practised. The result was that, by 1890, about 250,000 acres of this land were under ditch, and the region was producing the greatest part of the cotton grown in Mexico, as well as heavy crops of corn and wheat. The Tlahualilo basin was known to be the richest portion of this district, but the thirty miles of sun-baked desert separating it from the present course of the river presented an obstacle to utilization which proved too formidable for the cultivators of the Laguna country. In 1889 a project was formulated for carrying a ditch across the intervening desert to the head of the Tlahualilo cuenca, and converting the whole of the latter area into a huge hacienda.

Preliminary survey showed that the lowest level of the basin to be irrigated was about 100 feet below the point on the river Nazas which it was proposed to dam; that the main canal, on account of topographical conditions, would require a development of 39 miles; and that the slope of the lands within the basin was such that about 175 square miles out of the 210 composing the basin could be advantageously irrigated. A company was formed to undertake the work.

A dam of piles and riprap was thrown across the river at a point where it is about 1500 feet wide at flood. From this dam the line of the main canal was traced to the entrance of the Tlahualilo,—a distance of 39 miles. The canal terminated in a distributing tank at the entrance to the irrigable area, whence it bifurcated, one arm being carried along the western side of the basin.

The rainfall in the Bolson of Mapimi is confined to a few days of heavy showers about the beginning of June and the beginning of December. But up in the mountains of Durango, where the Nazas takes its rise, the rainfall at the same season is very heavy and protracted, resulting in high water in the river, which lasts for several weeks at a time. It is during these freshets that the cultivated lands in the Nazas district are irrigated. For the rest of the year they receive no water, except from occasional brief showers. In the Tlahualilo basin, a week or ten days of irrigation is all that is needed in the course of a year, the water soaking easily and quickly through the almost impalpable silt, and the hot sun forming a protecting crust which checks evaporation, and retains the moisture in the subsoil for a surprisingly long time. In fact, owing to their long roots, the cotton plants strictly require irrigation only once every other year, but corn and wheat, of course, must receive it at each planting. The distribution of the waters is regulated by government schedule, each property on the river being allotted its proportion of water, according to priority of settlement. Each canal on the river is permitted to take as many irrigations as it desires during the season of high waters, but in strict rotation. That is, after a property has taken one quota, it cannot repeat the process until all the others have taken theirs, when its second quota is available. Where another property, as often happens, does not care to use all the water to which it is entitled, its further allotments may be used by its neighbor. The waters, on leaving the river, are heavily charged with sediment largely volcanic in its origin, and this is deposited on the lands at each flooding in the shape of extremely fine mud.

Six years of experience with this property demonstrates the fact that irrigation, when applied to fertile land under a carefully planned and thoroughly executed system, where the water supply is owned by the user, puts agriculture among the least dubious of industries. The system adopted by the Tlahualilo Company is especially worthy of attention, because of the notable unity of plan pursued from the inception of the enterprise to its fullest development, and of its resultant economies. It was on this property that a disastrous experiment of colonization from Alabama took place in the year 1896, when hundreds of negroes were taken from Alabama and other points of the southern portion of the United States under the supposition that they could

withstand the down-pour of the tropical sun of Mexico, and by their knowledge of the cultivation of cotton succeed in carrying out the purpose of the men who undertook the enterprise. Unused to food conditions in Mexico, especially for want of bacon and corn bread, they were infested with sickness, which caused great mortality among them, and frightened and demoralized they fled from Tlahualilo, this experiment showing very plainly that Mexican planters cannot rely for labor on the colored people of the United States.

The production of cotton and corn in the vicinity of Torreon can be increased eightfold by building reservoirs in the Nazas River and its tributary cañons, to hold the water back for the irrigation of the vast area of fine cotton and corn lands that are yet unproductive, simply through the non-retention of the great amount of water flowing to the sea, unused, annually, and the same result could be obtained by doing the same thing with many other rivers in Mexico. With one-fourth of the water now needed to produce a good crop, the same amount of grain can be produced by good cultivation. The reason is that by the methods now in vogue in most parts of the country, so little soil is loosened by the plow that nearly all the water runs off, where rain is relied on, and only with a great amount of rain can a crop be raised. When irrigation is used, the water required to keep the hard ground moist is entirely in excess of the reservoir, rain, and river supplies. This is the reason of the short grain supply and of the necessity for importing during years of drought large quantities of corn. If the ground were plowed deep and well, it would absorb most of the rainfall and create sufficient surface moisture to meet the moisture from below, which would counteract the dry action of the atmosphere on the soil and roots of the grain, which, by its luxuriant growth, would soon shade the ground, and thus contribute still further to the retention of moisture.

The fact is, taking Mexico as a whole, that there is not a year so dry but that with good cultivation, sufficient grain can be raised to supply domestic demands, while all the excess above that quantity in favorable seasons should be used as feed for stock, which would supply the large quantities of lard, tallow, hard-oil, etc., now being imported, and would leave a large amount for export, together with a considerable quantity of meat for the same purpose, thus helping to cover the balance of foreign trade and keeping our silver dollars in the hands of the farmers and stockmen, to improve and increase their lands, herds, and flocks.

FAUNA.

The present Mexican fauna belongs, like its flora, to the North American zone, so far as regards the plateau regions, and to the Antilles in respect to the coast lands round the Gulf, while that of the

Pacific seaboard is intermediate between the Californian and South American. In the general aspect of its terrestrial animals, Mexico is connected more with the United States, whereas in its marine forms the reverse movement has taken place. Thus the prevailing species in the Gulf of Mexico as far as Tamaulipas and Texas, and the Pacific coast northwards to Sonora and Lower California, have migrated from South America. The species in the two oceanic basins differ almost completely; and, despite the proximity of the Pacific and Atlantic shores, their shells are quite distinct.

The fauna includes three species of large felidæ, the puma or American lion, jaguar, and ocelot; among the smaller is the wildcat. Wolves are common in the northern States, and also the coyote; besides which there are bears, wild boars, and bison. A species of sloth is found in the southern forests, with five varieties of monkeys. Of the other wild animals the principal are hares, rabbits, squirrels, two or three kinds of deer, beavers, moles, martens, and otters.

All the domestic animals introduced by the early Spanish settlers have multiplied prodigiously. The horses, though small, retain the spirit and graceful form of the Andalusian or Arabian stock, from which they mainly sprang.

The waters of the estuaries and coast streams teem with fishes, all the numerous varieties of which differ on the two oceanic slopes, but still present a certain analogy in their general distribution. Turtles are taken in considerable numbers on the coast, and the *carey*, or turtle-shell, of Yucatan and Guerrero is the object of a trade valued at \$20,000 yearly.

The ophidians are represented by a few boas in the southern forests, and several species of snakes, some extremely venomous, as the rattle and coral snakes. The largest lizard is the iguana, whose flesh is by some of the natives used as food. Noxious insects infest the hot regions in myriads; alacranes, or scorpions, in two different varieties, are everywhere feared, and many children were every year killed by their sting in the city of Durango before the proper antidote was found and used. Scolopendras, gigantic spiders, tarantulas, and mosquitoes abound.

Bees are numerous and their wax is an article of export, and the silkworm, though comparatively neglected, yields an annual profit of some importance. The birds of prey are eagles, hawks, and zopilotes, or turkey-buzzards, the scavengers of the coast towns, with three or four species of owls. Domestic fowl are extremely abundant. The parrots, humming-birds, trogons, and so forth, vie in richness of plumage with those of Brazil, and the Mexican songsters, the prince of which is the zenzontle, or mocking-bird, are unequalled by those of any other country.

Of all the Mexican fauna, two only have been domesticated : the huahulotl (*Meleagris Mexicana*), which is a species of duck, and the turkey, introduced into Europe by the Spaniards from the West Indies, hence by the French called "coq d'Inde." The techichi, an edible dumb dog, was soon exterminated when taxed by the Spanish authorities. The other farmyard animals have all been introduced into Mexico by the conquerors.

In the Gulf of California, and especially near La Paz, and the neighboring archipelagoes, extensive beds of pearl oysters are fished. Some other islands in the same gulf are frequented by myriads of various species of aquatic birds, and have already yielded many hundred cargoes of guano.

It is noteworthy that the Pacific islands, lying at some distance from the coast, have all a fauna different from that of the mainland. Thus the little Tres Marias group, about sixty miles off the coast of Jalisco, has a special species of humming-bird. The Revillagigedo Archipelago also forms a separate zoölogical zone, and the island of Guadalupe, over one hundred and fifty miles distant from Lower California, has eleven species of land birds, every one of which differs from the corresponding species on the adjacent continent.

ETHNOLOGY.

Mexico is inhabited by native Indians found there during the Spanish conquest, by descendants of the conquerors of Mexico and other European races, and by a mixture of the two. There are so few inhabitants of African descent that it is hardly worth while speaking of them. The proportion of this population is about as follows : Of European descent, 19 per cent. ; native Indians, 43 per cent. ; mixed races, 38 per cent.

Mexican Indians.—The native Indians found by the Spaniards belong to several nations and tribes, having different features and entirely distinct languages. The principal of these tribes are the following, some of which are now extinct :

Otomi,	Apache,	Tarahumara,
Chichimec,	Irritilas,	Tepehuan,
Huastec,	Tamaulioecs,	Sabaibos,
Totonac,	Zacotec,	Acaxee,
Mixtec,	Huastec,	Xixime,
Zapotec,	Zoqué,	Concho,
Mahuas,	Opata,	Manosprietas,
Toltec,	Guaicuri,	Comanche,
Olmecs,	Yaqui,	Cuachichils,
Xicalancs,	Mayo,	Tarascos,
Tula,	Seri,	Mixé.

These tribes have been classified in the following families :

Mexican Family ;	Totonaca Family ;
Sonorense Opata-Pima Family ;	Mixteco-Zapoteca Family ;
Guaicura y Cochimi Laimon Family ;	Matlalzinga ó Pirinda Family ;
Seri Family ;	Maya-Quiche Family ;
Tarasco Family ;	Chontal Family ;
Zoque-Mixé Family ;	Huave Family ;
	Apache Family ;
	Otomi Family.

There is a great deal of similarity between the Mexican Indians and the Malay Asiatic races—especially the Japanese branch—which gives foundation to the idea that the aborigines of Mexico originally came from Asia, or *vice versa*.¹ Their intensely black hair and eyes, their brown or yellow color, their small stature and the slight obliquity

¹ The following extracts from the San Francisco, Cal., *Bulletin* of June 7, 1897, confirm my views on the subject :

“ Information is received from Australia concerning the reports of F. W. Christian of the Polynesian Society, who has returned to Sydney after an extended tour of the islands of the South Seas, the Caroline group especially, where he has been on a successful search for ethnological specimens. These reports are of great importance to the scientific world and are said to let much light on a vexed question which has puzzled the most learned savants for years. Mr. Christian has discovered extensive traces of the Chinese and Japanese in the islands of the Pacific, and claims to have discovered evidence pointing to the existence of a civilization of nearly two thousand years ago, which is linked with the ancient civilization in Central America, and will probably explain the origin of the Aztec races.

“ Under the auspices of the Polynesian Society, according to advices from Sydney, *via* Honolulu, received per *Coptic* yesterday, Mr. Christian worked. The gentleman spent nearly two years looking for traces of the Chinese in the islands, and was lucky enough to find ancient records, specimens of handiwork and weapons which proved that Asiatic races were extensive traders among the South Sea group thousands of years ago. Evidence of a very decisive nature was secured which shows that a large trade was carried on *via* the islands of the Caroline group, between China and Central America, and that the ancient Chinese were more inclined to emigrate than their latter-day brethren and colonized extensively.

“ Extensive inquiries were made as to the traditions of the islanders, and many discoveries were made concerning the early history of the Malays with regard to navigation, all proving that the Torres strait's route to the Pacific was not taken, but that voyages were made to many of the Caroline islands.

“ The coincidence is a strange one that a despatch from Hermosillo, Mexico, dated June 6th, reports that a rock recently discovered in the mountains of Magdalena district, State of Sonora, which is covered with Chinese inscriptions, has just been visited by Sen Yup, a well-educated Chinese of Guaymas. He says the inscriptions are Chinese, but are somewhat indistinct. He made a copy of them, and has translated enough of the lines to show that the writing was probably inscribed on the rock at least two thousand years ago.”

of their eyes, are features common to the Mexican Indians and the Japanese. When I first came to Washington, at the end of 1859, not having been out of Mexico before, I retained very vivid recollections of the Mexican Indians, with whom I had been somewhat closely associated ; and shortly afterwards the first Japanese Embassy came to this country and was received in a very solemn manner by Mr. Buchanan, then President of the United States. The Embassy consisted of about forty persons altogether, comprising ministers, secretaries, interpreters, servants, etc., and were dressed in their national gala costumes, not having yet adopted the European one. The Diplomatic Corps having been invited to the reception, I attended as a member of the same, and was greatly struck by the remarkable similarity which I found between the Japanese members of the Embassy and the Mexican Indians, whom I had just left. It seemed to me that had I collected at random forty Mexican Indians and dressed them in the same gorgeous costumes that the Japanese wore, nobody could have detected the difference.

Some of the Indian languages seem to me to resemble strongly the Oriental ones, though of course I cannot speak with authority, as I do not know any of those languages and have heard only the Chinese, Japanese, and Korean spoken ; but I am sure that if any educated and intelligent Chinese should go to Mexico and spend some time among the Indians, he would find traces in the language which would contribute greatly to clear up this problem. Mr. Tateno, a former Japanese Minister, who visited Mexico, found, during his short stay in that country, several words that are used in Japan and that have the same meaning in both countries. I am aware that Señor Pimentel, a very learned philologist, who made a special study of the languages of the Mexican Indians, finds no similarity at all between them and the Chinese or other Oriental languages ; and that even the Otomi language, which is monosyllabic, he finds to have no similarity to the Chinese. But, notwithstanding that great authority, I believe that the aborigines of both continents, that is, Asiatic and American, were originally of the same race, and that there must be some relationship between their respective languages.

The Indians of the different tribes do not generally mix with one another, but intermarry among themselves, and this fact contributes largely to their physical decay, and makes very difficult, at least for some time to come, the complete assimilation of all the Mexican population.

The Mexican Indians are on the whole a hard-working, sober, moral, and enduring race, and when educated they produce very distinguished men. Some of our most prominent public men in Mexico, like Juarez as a statesman, and Morelos as a soldier, were pure-blooded

Indians,¹ and fortunately there is no prejudice against their race in Mexico, and so when they are educated they are accepted in marriage among the highest families of pure Spanish blood.²

I have been a great deal among them, and my knowledge of their characteristics only increases my sympathy and admiration for them. In the State of Oaxaca, for instance, where I spent the early years of my life, I have seen Indians from the mountain districts, who, when they had to go to the capital, especially to carry money, would form parties of eight or ten to make a ten days' round trip, carrying with them their food, which consists of roasted ground corn, which they take three times a day ; stopping at a brook to mix it with water, and

¹ Sir William Hingston, President of the Surgery Section in the Second Pan-American Medical Congress, held at the City of Mexico in October, 1896, in an interview which was published by *The Gazette* of Montreal, Canada, of December 2, 1896, said, concerning his visit to Mexico, among other things :

"The pure-blooded Indian was seen on all sides. . . ."

"The Spaniards would seem to have pursued the same course as was followed by the original French settlers, *they did not shove aside the native Indians as useless lumber, to be gotten out of the way*, as a distinguished Harvard professor puts it, but they treated them as people in possession of the soil, with whom it was not only right but proper to ally in marriage. I have always regarded our North American Indian as the best type of the aborigines in stature. I still believe he is, but not so in intellect. The broad, massive forehead of the native of Mexico, and his soft but prominent and intelligent eye, are evidences of mental power. . . ."

² I take from a spicy article published by Mr. Charles Dudley Warner, in *Harpes's Magazine* for June, 1896, the following description of the dress of the poorer classes in Mexico :

"Herbert Spencer might extend here his comments on the relation of color to sex. It is the theory that all the males of birds have gay plumage in order to make them attractive to the other sex, while the females go in sober colors. This is also supposed to hold true of barbarous nations. The men who dress at all, or use paint as a substitute, wear bright colors and more ornaments than the women, while the gentle sex is content to be inconspicuous. Needless to say that in what we call civilization, this rule is reversed. The men affect plain raiment, while the women vie with the tropical birds of the male gender. Tried by this test Mexico has not reached the civilization of the United States. The women of the lower orders are uniformly sober in apparel, and commonly wear drawn over the head a reboso in plain colors. The scant dress is usually brown or pale blue. It is the men who are resplendent, even the poorest and the beggars. The tall conical hats give to all of them an "operatic" distinction ; the lower integuments may be white (originally) as also the shirt and the jacket ; or the man may have marvellous trousers, slit down the sides and flapping about so as to show his drawers, or sometimes, in the better class, fastened down with silver buttons ; but every man of them slings over his left shoulder or wraps about him, drawing it about his mouth on the least chill in the air, a brilliantly colored sarape, or blanket, frequently of bright red. Even if he appears in white cotton, he is apt to wear a red scarf round his waist ; and if he is of a higher grade, he has the taste of a New York alderman for a cravat. This variety and intensity of color in the dress of the men gives great animation and picturesqueness to any crowd in the streets, and lights up all the dusty highways."

sleeping on the bare ground, preferring always the open air ; getting up before daylight and starting on their journey at daybreak immediately after their early meal, speaking no Spanish and travelling about forty miles a day. When they reached the city of Oaxaca, they would remain there one or two days, and go back to their homes without taking part in any dissipation. They prefer to live in the high, cool localities, and they have their patch of ground to raise corn and a few vegetables in the hot lowlands, sometimes thirty miles away from their homes, and carry their crops on their backs for all that distance. They make very good soldiers, and military leaders have used them to great advantage during our revolutions.

Professor Starr's theory that we are all on this Continent assuming the type of the Indian, is, in a measure, true. It is nothing new, for it was already indicated by an English physician travelling in the British colonies before the United States were thought of.

The great task of the Mexican Government is to educate our Indians and make them active citizens, consumers, and producers, elevating their condition. Before we think of spending money to encourage European immigration to Mexico, we ought to promote the education of our Indians, which I consider the principal public need of the country.

Increase of Mexican Population.—In the beginning of the century Baron Humboldt, who visited Mexico and studied very carefully the conditions of the country, thought that the Indian race, which was then very numerous, would continue to increase and would be the preponderant race of Mexico, as far as numbers were concerned, as it showed a large proportion in a census made in 1810 by Don Fernando Navarro y Noriega, and which appears in Baron Humboldt's *Political Essay of New Spain*. According to that census the population of Mexico was then divided as follows :

European and American Spaniards.....	1,097,928
Indians.....	3,676,281
Mixed races or castes.....	1,338,706
Secular ecclesiastics.....	4,229
Regular ecclesiastics.....	3,112
Nuns.....	2,098
Total.....	6,122,354

Including among the Europeans the ecclesiastics and nuns, the population was, according to that census :—

Europeans.....	1,107,367	or 18 per cent.
Indians.....	3,676,281	" 60 " "
Mixed races.....	1,338,706	" 22 " "
Total.....	6,122,354	" 100 " "

In the census of 1875 the following results appear :—

European race and descen-			
dants of the Spaniards.....	1,899,031	or 20	per cent.
Mixed race.....	4,082,918	" 43	" "
Native Indian race.....	3,513,208	" 37	" "
Total.....	9,495,157	" 100	" "

The increase of population in the 65 years which elapsed between the two censuses mentioned, deducting from the census of 1810 the inhabitants of Texas, New Mexico, and Upper California, who had passed to the United States, numbering 58,338, was

Population of 1810.....	6,064,016
Census of 1875.....	9,495,157

Increase of the population in the 65 years.....3,431,141

From the preceding data it appears that the European race nearly doubled its population in the space of 65 years, and at the rate of 1.1 per cent. of increase per year ; that the mixed race trebled it at the rate of 3.25 ; and that the native race diminished it at the rate of 0.058 per cent. per annum.

Families in Mexico are generally very large, often having ten or fifteen children. I remember how much surprise it caused in Washington, my stating in the presence of Señor Don Jacobo Blanco, the Mexican Commissioner in the late International Boundary Commission, who was recently here for a year finishing his office work and maps and preparing his report, that he was the twenty-fourth child in his family, his father having been twice married.

Decrease of the Indian Population.—It further appears that the Indian population has been decreasing since the beginning of the present century, notwithstanding the fact that the Indian race on the whole is very prolific.

The causes of the decrease of the Indian population in Mexico are various ; bad nourishment, insufficient shelter from the inclemency of the weather, wretched attendance in sickness, and many others, some of which I shall mention here, having contributed toward the degeneration and decline of the race.

The small-pox, owing to the carelessness or indolence of the parents in regard to vaccination, or their repugnance to it, causes deplorable ravages in this race, more especially among the individuals that live at any considerable distance from the cities.

Indian women, even when far advanced in pregnancy, do not ab-

stain from hard labor, and, without any care for their coming offspring, continue grinding their corn until the moment of parturition. Then, before the proper time for taking the child from the breast, it is fed with food unsuitable for its age and difficult of digestion, which occasions diarrhoea or other maladies that either cause its death or at least contribute to its imperfect development.

Another circumstance which causes the degeneration of the Indians is their premature marriages. In Mexico the marriageable age for women has been fixed by law at eighteen years, and in the tierra caliente, or hot country, at fourteen; but in some places Indian girls are married at twelve. Every Indian father considers it his duty to marry his children, whether boys or girls, as soon as they are of age, the parents of course making the match to suit themselves.

This used to be the case not only with the Indians, but even with persons of Spanish descent. I once heard General Degollado, a very good and prominent man in Mexico, say, that the day he married he took, immediately after the ceremony was over, his bean-shooter and went to shoot birds, because he had no conception of what he had done, his parents having arranged the match for him; but he added that he could not possibly have made a better choice of a wife.

The Indians are strong by nature; and in this is to be found the fact that so many of them reach an advanced age, in spite of their scant and poor food, their unhealthy mode of living, and their damp and unwholesome habitations, consisting of miserable huts where whole families are huddled together.

The Spaniards in Mexico.—The Spaniards are a money-making, wonderfully frugal race, since they have been battling with hard conditions at home for centuries. The Spaniard in Mexico is—as Richard Ford who spent thirty years in the peninsula, and who was a close observer, depicts him—a hardy, temperate man, well fitted, under favorable conditions, to become a dominant influence.

In Mexico, the energy of the Spaniard is remarkable. He is forceful of word and phrase, energetic in his movements, immensely vital, tremendously persistent, and wonderfully enduring. After thirty years behind a counter selling groceries, he retires, a man of fortune; not always large, but sufficient, and is still a man of force and ready for undertakings demanding good brain power and courage. They come over mere lads, from ten to fifteen, toil and moil, feed frugally, and sleep hardly, and they become millionaires, bank directors, great mill owners, farmers on a grand scale, hot-country planters and monopolists, for the Spaniard is born with the “trust” idea; while his sons are too often dudes and spendthrifts.

The thrifty Spaniard toils and saves, and his ambition is to marry a rich girl, frequently the daughter of a Mexican landowner, and so he

lays the foundation for permanent wealth ; for everywhere, the world over, the man who gets the lands and holds on to them is the wealthy man. Speculators and financiers come and go like bubbles on a river, but the landed proprietor keeps a permanent clinch on humanity.

There is one check to the growth of Spanish influence in Mexico, and that is the climate. All Europeans, no matter what their nationality, become physically modified by residence in the new world ; and nowhere is the effect of climate more noticeable than in the tropics. The children of the Spanish residents are less energetic than the parents, and the third generation are altogether Creoles. Just as the Mexican of Spanish descent is, as a rule, less energetic, not so vascular, and less vigorous than the Spaniard, so is the American less full-blooded and leaner than the Englishman. The change that takes place in the human organization, transplanted from the old world to the new, is a profound one.

English and Germans in Mexico.—The present century has seen many changes in the commercial world of Mexico ; the great English houses have almost all disappeared ; especially has this been marked in the dry-goods, or draper's business. The Germans, with superior economy, if with no more of enterprise, drove the English out of that profitable business, and in time themselves succumbed to the still closer methods of the Barcelonettes who gained a foothold in the business which they have successfully maintained. The dry-goods business in the Republic is largely in the hands of men who speak the French language. From the great houses of the capital go forth bright young men, trained to business habits who are established over branch concerns in the interior and coast towns. Their employers become their backers, and a close intimacy is maintained, to the mutual advantage of older and younger merchants.

Very few of the foreigners who settle in Mexico, and especially Spaniards, are educated, as most of them hardly know how to read and write. They very seldom become naturalized Mexicans, and almost always keep their allegiance to the country of their origin. That seemed natural when Mexico was in constant turmoil, and many of the foreigners going there expected to make large fortunes by means of diplomatic claims ; but that reason can hardly hold good now, when the country is at peace, and perfect security is extended to every inhabitant. If the foreigners continue keeping their old nationality when they become permanent settlers of Mexico, some changes may be necessary in the legislation of the country affecting their condition.

Americans in Mexico.—It will be very difficult for the fun-loving, self-indulgent, Anglo-Saxon Englishman of America to compete with these self-denying Spaniards, capable of living with the nose to the grindstone twenty, twenty-five, or thirty years, eating always sparingly,

drinking wine, but in moderation, spending no money, dressing poorly, and ever with a fortune accumulating. The American wants to cut a dash and so does the Englishman, else the English would have maintained their commercial supremacy in Mexico. They lost it to the more frugal and economical Germans.

The American is a speculator, a dreamer of golden dreams ; he lives for the eyes of other people ; he is not capable of the patience that keeps a man tied to a desk or shop for half a lifetime, making a savings bank of himself.

Some Mexicans are afraid that a free influx of citizens from this country may Americanize it. This is true as to the means of transportation, the introduction of electric lights, improved hotel accommodations, and where similar improvements are concerned. But there is no doubt of the persistence of traditions and habits, and the influence of climate. It is difficult to introduce the American push and restlessness in business, and to overcome the habits formed in many centuries of letting the morrow take care of itself. There must be the mid-day siesta, and the number of working days is reduced by several feast days, saints' days, and holidays, besides the Sundays. There is no doubt that the productiveness of nature is an inducement to very leisurely labor, and the lack of any sharp division of seasons is a sort of moral discipline, as well as a stimulus to extra exertion in summer to prepare for winter. What must be the effect upon character when this stimulus is wanting ? It is possible, of course, that industry will be stimulated by the inflow of settlers from the north, and that Mexico will take on new enterprise and productive vigor ; but I think it is easier for Americans in Mexico to fall into Mexican ways and Mexican moral views than it is to convert the Mexicans to the American view of life. I do not doubt that Mexico has a great industrial, agricultural, and manufacturing future, but I fancy that its power of absorption, like that of Egypt, is greater than its facility of adaptation.

Ruins.—We have in Mexico some of the most ancient and remarkable ruins, and although there are different surmises about the time at which they were built and the people who built them, nothing is known positively about them.

The principal ones are in Uxmaland and Chichen Itza in Yucatan, Comalcalco in Tabasco, Teotihuacan and Cholula in Puebla and Tlaxcala, and Mitla in Oaxaca.

Uxmal.—Uxmal is not far from the city of Merida, the capital of the State of Yucatan, supposed to have been built by the Mayas, and different books have been written about them, especially one by Dr. Augustus Le Plongeon, a French savant, who passed many years in Yucatan, studying its magnificent ruins, and published in New York, in 1896, a book entitled *Queen Mo' and the Egyptian Sphinx*, in which

he contends that the empire of the Mayas, which had its seat at Yucatan, was the cradle of civilization, and that from there it went to India, Egypt, and finally to Greece and Western Europe.

Palenque.—Very likely the same Mayas built the large ruins which still exist in the district of Palenque in the State of Chiapas, and in some places in Guatemala.

Cholula.—The great pyramid of Cholula, made known to the scientific world by Humboldt, which is eight miles from Puebla, has been pictured and described. Its base is 1000 feet on each side, and it is built in two great terraces, the first being 71 feet, and the second 66 feet, in height. The top is 203 by 144 feet. So far as investigations have revealed, the great pyramid is artificial and is constructed of sun-dried brick.

Teotihuacan.—Teotihuacan, an ancient city lying twenty-five miles northeast of the City of Mexico, and occupying an area of about one and a half or two miles, contains some of the most remarkable series of ruins. To the north of the ruins is a truncated pyramid, rectangular in form, squared to the points of the compass, and known as the Pyramid of the Moon. South of it, at a distance of about 1300 yards, is another pyramid of similar form, known as the Pyramid of the Sun. Its perpendicular height is 223 feet, and its base measures about 735 feet from east to west. Both pyramids are united by a straight street, which starts from a circular plaza at the south side of the Pyramid of the Moon, and loses itself in the barranca south of the Pyramid of the Sun.

These colossal pyramids are regarded as among the most ancient monuments of Mexico, far antedating the civilization found by the Spaniards. They are wonderful illustrations of what perseverance and time will accomplish. Now even the means which the builders used for handling the immense blocks of volcanic stone with which they constructed is unknown. Other ruins, in the character of little mounds, are found scattered over the extensive plain in which the two pyramids are situated. The street or avenue which united the latter is called the "Road of the Dead." Along its entire length, parallel to it on both sides, there is a terrace constructed of cement, clay, and broken lava, faced with a coating of mortar or plaster, highly polished, and painted red and white. Desire Charnay removed the rubbish from one of the mounds on the side facing this road, and discovered what he calls a "palace," with two large halls and various small rooms. In 1886, Señor Don Leopoldo Batres made an excavation in one of the mounds, and found two polychrome frescos painted on the wall of the building which was laid bare. The question is naturally asked, how these monuments came to be covered? Was it by an earthquake, or by the hands of the builders themselves? Señor Batres inclines to

the latter view, as he found the roofs of the houses perfectly preserved, while the interior of the rooms was in every case filled with stones neatly fitted into the spaces, and joined with a clayish cement to form a compact mass. His conclusion as to the pyramids is, that they are two great temples erected to two old Mexican divinities. Each pyramid consists of five terraces, which diminished in size until the height of 223 feet was reached. Each has on one of its sides a stairway six and one-half feet in width, which makes five zigzag turns, and leads to the sanctuary or shrine on the summit. The outer surface of the pyramids, and perhaps the interior as well, was plastered over with a mortar of lime, hard and smooth, and decorated with frescoes, representing quasi-historical events and scenes.

The small mounds scattered over the area occupied by the ruins were, according to Batres, dwellings and small shrines. Each contained from six to twelve rooms, quadrangular and rectangular in form. The cornices as well as the walls were beautifully ornamented in colors. On some as many as twenty tints had been used. The doors were rectangular, never trapezoidal in form, although the latter style has been erroneously attributed to ancient American architecture. They measure eight feet in height by about three feet in width. The houses had neither windows nor balconies. The city was crossed by subterranean aqueducts constructed of stone, the walls of which were plastered with firm and smooth mortar. Near the Pyramid of the Moon, among the rubbish, there was a monolithic statue of colossal dimensions. It represents a woman with a characteristic head-dress, and wearing a necklace of four strings of beads. Travellers in Teotihuacan can find countless miniature heads modelled in clay anywhere on the freshly-plowed stretches of level land that lies across the broad, straight Micoatl, or "Path of the Dead." They vary in length from one to two inches, and invariably have nothing more than a neck attached to them. They may be distinguished by this peculiarity from those that are applied as ornaments to terra cotta vases, and from fragments of "idols." The features and peculiar head-dresses that adorn these little heads of Teotihuacan vary greatly, and this diversity has given rise to, and been quoted in proof of, the migration of tribes, of the mixtures of widely differing races, or of their succession to each other in the occupation of the Valley of Mexico. Owing to the unfamiliar aspect of some of these head-dresses, it has been asserted that they could not be even "Toltec," but must be relics of still more remote and unknown races of men. Various uses have been assigned to them, the commonest supposition being that they were in some way associated with ceremonies relating to the dead. There is probably no subject connected with Mexican archæology, except the calendar, that has given rise to more discussion. Dr. E. B. Tylor regarded them as a puzzle,

and Professor F. W. Putnam has spoken of them as the "riddle of the many heads." Desire Charnay saw in some of them Chinese and Japanese masks, and even types of the white race, proving in his opinion how many races must have been mingled or succeeded each other on this old continent.

Mitla.—About twenty miles east of the city of Oaxaca is an Indian town called Mitla, near which still remain the ruins of great edifices and palaces. The temples were built, it is supposed, by the ancient Zapotecas, and are the most interesting relics of the earlier civilizations of Mexico. The first description of these ruins was given by the Spanish priest, Burgoa, who accompanied the conquerors of Montezuma. The interior of the principal hall or room of the main palace is supposed to be the teocali of the high priest. The peculiar architecture and elaborate and grotesque decoration can easily be observed. It is astonishing to see the enormous size of the stones used in the walls of these temples. Professor Bickmore said that he had seen nothing to equal them except at Baalbec, in Syria. At Mitla are found some clay images, mostly miniature, doubtless of gods, but some of them no doubt portraits, and some of these bore a striking resemblance to the little heads found at the pyramids of the Sun and Moon in the Valley of Mexico; that is, some of them had the slant Oriental eyes, and others Ethiopian features, very different from any races we now know in these regions. The ruined temples of Mitla are covered with stucco, which was painted Pompeiian red. There is a pyramid also at Mitla, and there are some elaborately wrought sepulchral chambers.

I borrow from Mr. Vivien Cory the following extracts of his description of the ruins of Mitla.

"There are four of these places; the first is almost entirely destroyed, only some huge monolithic slabs supported horizontally upon tottering piles of broken stones remaining; while everywhere amongst the ruins have sprung up the grass huts of the Mexican Indians, and of the fourth or one farthest from the hamlet nothing but indication of the site is left, upon which the Spaniards have reared a modern church. It is in the two palaces that lie between, each slightly raised above the surrounding country on a separate eminence, that the interest centres.

"One of these is in the form of a double Greek cross, its stem running north and south, and its arms extended east and west. In the centre is the large court, surrounded on all sides by rising ground and ruined mounds of stones: there are traces still remaining of the foundations, that speak of four apartments built upon these mounds to face the court, but of these those on the west and south sides have disappeared; on the east side, only two colossal pillars and a portion of the walls remain, while to the north side the whole apartment forming the head of the cross has been spared and stands almost unharmed in its original beauty and richness. The façade of this apartment extends the whole length of the court, one hundred and forty-one feet, and its height is a little over fifteen feet: the material is freestone, the color a faint, dull, amber tint, soft as the light seen in the sky at evening. In the centre are three square portals and above these

forming the head-piece to them all extends one long and narrow panel of carving, a high relief of the natural stone on a crimson ground. The whole façade is composed of a series of these panels, from the straight line of the foundation-stone to the straight line of the summit, nine panels being on each side of the entrance, arranged in three tiers, divided by horizontal bands of the natural stone. In some of the panels, the ground retains still a faint tint of its former rich vermilion, in others, all color has subsided into the soft neutral shade of the freestone. The designs are wonderfully rich and varied, thirteen different patterns being represented on this façade alone ; all these designs are remarkable for the straight lines in which they are executed and the absence of all curves. Throughout all the ruins, upon the walls of which appear twenty-three different models of carving, only two of these represent any curve in their design. In one of these two there is visible the form of the Arabic letter ' L ' placed horizontally, and in the other a double curve ' S,' possibly intended to represent or suggest the snake. With these exceptions the designs are of the Greek key pattern, variations on this, or parallelograms.

" Behind this façade is a narrow court, roofless as all the courts are, and empty, save for six colossal pillars standing at even distances down the centre, and giving to this chamber the name of Hall of the Monoliths. Each pillar is one solid stone, eleven feet high and eleven feet in circumference. A low stone passage leads from this chamber northward to the smallest and richest court of all, entering it at the southeast corner. There is comparatively little trace of the destructiveness of the elements or the iconoclasm of man here. The court and all the four chambers opening from it are perfect and singularly rich in carving. The court is perfectly square and the chambers are entered from it, each through one square doorway, the roof of which is formed by a huge monolith, thirteen feet long and with a richly carved face. Of these four lintels each has a separate design. Each of the four walls has six panels, the uppermost extending the whole length of the wall, two smaller panels being on either side of the entrance, and one long narrow one above it. Between the panels stand out in high relief the horizontal and vertical edges of the freestone, forming a symmetrical frame to each panel.

" Within the four chambers the walls are designed differently, the carving running simply and evenly round the entire room in three straight horizontal bands, each band possessing a separate pattern and being about three feet in width. Beneath these bands of carving was originally, evidently, a dado of vermilion stucco, of such fine and delicate quality that the smooth and polished surface resembles marble. Portions of this delicate stucco still adhere to the crumbling walls in places and are of various colors, scarlet, black and white. In some instances this stucco seems to have been plain, simply bearing a brilliant polish, in others, there remains distinctly traced in white upon a crimson ground, a wierd, fantastic, yet handsome design, the head ; half horse, half dragon, repeated in four inch squares. This latter ornamented stucco, however, does not appear except in the fourth palace, containing the Spanish church, where it is visible on the walls of one of the courts, now used as a stable for the padre's horse. Leaving the richest of the centre palaces, passing through a gap in the ruined wall on the south side, descending the elevation on which it is placed and ascending the opposite eminence, the patio of the second palace is reached. This is almost wholly in ruins ; three of the façades that face the court remain indeed, but the great smooth slabs with which the walls were faced have been torn away at the base, and most of the beautiful panels of carving stripped from the front. Yet it is in this ruined palace that one lingers longest and to which one's feet return, drawn by an irresistible fascination ; for this palace contains the tomb and the pillar of death.

" This subterranean vault is called by general consent a sepulchre, but there is no line of history, no record, no tradition even, left to explain to us its origin and use. It

may have been a torture-chamber, sacrificial hall, or tomb. The excavation is but a little below the surface of the court, now carried down so deeply that the light is wholly excluded. From the entrance there is enough to fill the interior with a sad, gray twilight. The vault is in the form of a simple cross lying north and south ; its walls are massive and heavily decorated with panels of carving let into their sides, while it is roofed by enormous monolithic slabs that reach from wall to wall. In the centre of the cross, just where by descending a few steps one enters the tomb, stands the pillar of death, round which, the Indians say, should a man clasp his arms he must shortly afterwards die. Does not this very tradition, handed down perhaps through the long file of countless years, seem to indicate that this pillar was some ancient stone of sacrifice to which human victims were bound or chained, and from which death alone released them ? As one gazes at the massive column, that one man's arms alone could not entirely encircle, the eye notices an indentation round the base where the column sinks into the floor. The stone is corroded and worn away as by the long friction of ropes or chains.

" Most of the panels do not consist of actual carving, though they produce that effect at a few yards' distance ; they are formed in reality by small slabs of the freestone cut perfectly square and inserted edgewise into the wall, the remaining edges standing out at various distances from it and thus forming the different designs. This, although a work of infinite patience, does not necessarily presuppose a high stage of civilization, no instrument sharper than hard stone being required to cut the slabs of soft freestone ; and that only a stone instrument was employed by the workers seems indicated by the fact that, in the large panels where the stone is actually carved, the edges are not sharp, but rounded, as if made with a blunt tool. The effect of the panels of inserted squares of stone, however simply produced, is that of the most finished and clear-cut carving and the designs themselves are rich and elaborate. There is no crudity, no harshness in them, no suggestion of the primitive savage's scratching on his native rock ; but rather that of Greek work on some Athenian temple. The patterns have a complicated elegance and distinction of line that can only be produced by a people of cultivated mind and eye.

" Evidence, too, of what high grade of civilization in some ways at least they must have arrived at, lies in the gigantic stones that they have placed as lintels over their doorways and which in their immense weight and bulk have defied the greed or rage of all the succeeding races to remove or destroy. The mystery here is the Egyptian mystery of the Pyramids ; that these enormous blocks of stone are resting here in positions and elevations where it would require all the modern knowledge of mechanics, engineering skill, and mechanical appliances to place them ; and, as in Egypt, so here the mystery will never be solved, as the builders have passed hence and left no clue. The solid stone rests there upon its supporting pillars before the eye as it has rested for a thousand years, but how the perished hands lifted and placed it there remains its own inviolable secret.

" Leaving the palace court by the south side and following the road to the dry and stony bed of a wide river, if one turns aside here a little to the eastward he finds himself facing a Zapotecan mound, a solid base composed of earth and stones, in which are visible at intervals large slabs of cement, portions of terraces and tiers that originally formed its sides. Ascending this, from the summit one can overlook the whole valley."

LANGUAGES.

About one hundred and fifty different Indian languages are known to have been spoken by the Mexican Indians. The Spanish monks accompanying the conquerors and who went to the country soon after-

wards compiled grammars and even dictionaries of some of these languages ; but the Indians falling into a semi-barbarous state after the conquest, having lost their civilization and literature, their languages have either disappeared completely or become very primitive. and it is ascertained that some of them have become entirely extinct.

The Spanish is, of course, the language of the country and most of the Indians speak it, although very imperfectly and incorrectly ; only a small portion of them speaking no language but their own.

The chief languages spoken in Mexico proper, excluding Chiapas and Yucatan, are as follows :

Nahuatl or Mexican (Aztec) with Acaxee, Sabaibo, Xixime, Cochimi, Concho and other members of the same family.

Seri, Upanguaima, and Guaima.

Papago, Opatá, Yaqui, Mayo, Tarahumara, Tepehuan, Cora, etc.

Apache or Yavipai, Navajo, Mescalero, Llanero Lipan, etc.

Otomi or Hia-hiu, Pame, Mazahua, etc.

Huastec, Totonac.

Tarascan, Matlaltzincan.

Mixtec, Zopotec, Mixé, Zoqué, Chinantec.

Señor Don Manuel Orosco y Berra wrote a treatise on the language of the Indian tribes in Mexico entitled "Geography of Languages," which describes the languages of the races who inhabited Mexico, and Señor Don Francisco Pimentel enlarged upon that work, making philological comparisons, and from the data collected by both authors Señor Don Antonio Garcia Cubas a distinguished Mexican geographer made the following synopsis of the Indian languages spoken in Mexico.

SYNOPSIS OF THE INDIAN LANGUAGES OF MEXICO, FORMED ACCORDING TO THE CLASSIFICATION OF DON FRANCISCO PIMENTEL.

NOTE.—The sign * indicates that the classification is doubtful.

GROUPS.	FAMILIES.	LANGUAGES.	DIALECTS.
MEXICAN-OPATA.		1st Order.—Languages polysyllabic, polysynthetic of sub-flexion.	
	I. MEXICAN.	1. Mexican, Nahuatl or Asteca.....	{ Concho, Sinaloense, * Marapil, Jalisciense, Ahualulco, Pipil, Niquiran.
		*2. Cuiclateco.....	
		3. Opatá, Teguma or Teguma Sonorense.....	{ Tecoripa. Sabaqui. Various.
		4. Eudebe, heve or hegue, dohme or dohema-batuco	
		5. Joba, joval ova.....	
		6. Pima, nevome, ohotama or Otama.....	
		7. Pepehuan.....	
		8. Papago or Papabicotán.....	
		9 to 12. El Yuma comprising Cuchan, Cocamaricopa or Opa, Mojave or Mahao, Diegueño, or Cufell, Yavipai, Yampai, and yampaio.....	
		13. * Cajuenche, Cucapa or Jallicuamay.....	
		14. Sobalpure	
		15. Julime.....	

GROUPS.	FAMILIES.	LANGUAGES.	DIALECTS.
		1st Order.—Languages polysyllabic, polysynthetic of sub-flexion.	
MEXICAN-OPATA.	II. SONORENSE OR OPATA-PIMA.	16. Tarahumar.....	{ Varogio or Chini- nipa, Guazapare, Pachera, and others.
		17. Cahita or Sinaloa.....	{ Yaqui, Mayo, Tehueco or Zuaque.
		18. Guarave or Vacoregue.....	
		19. Chora, Chota, Cora del Nayarit.....	{ Muutricat, Teacucitzin, Ateanaca.
		20. Colotlan.....	
		21. Tubar.....	
		22. Huichola.....	Various.
		23. Zacateco.....	
		24. Acaxee or Topia, comprising Sabaibo, Tebaca, and Xixime, the last of doubtful classification.....	
	III. COMANCHE SO- SHONE.	25. Comanche, Nauni, Paduca, Hietan or Getan. 26. Caigua or Kioway. 27. Shoshone or Chochone. 28. Wihinasht. 29. Utah, Yutah or Yuta. 30. Pah-Utah or Payuta. 31. Chemegue or Cheme-huevi. 32. Cahuillo or Cawio. 33. Kechi. 34. Netela. 35. Kizh or Klj. 36. Fernandefio. 37. Moqui and some others spoken in the United States.....	Various.
	IV. TEXANA OR COA- HUILTECA.	38. Texano or Coahuilteco.....	Various.
	V. *KRES ZUÑI.	39. Keres or Quera..... 40. Tesuque or Tegua..... 41. Taos, Piro, Suma, Picori..... 42. Jemez, Tano, Peco..... 43. Zuñi or Cibola.....	{ Kiwomi or Ki- vome, Cochi- teumi or Qui- me, Acoma and Acuco. Various.
	VI. MUTSUN.	44. Mutsun. 45. Rumsen. 46. Achastli. 47. Soledad. 48. Costefio or Costanos and other languages of California.....	
	VII. GUAICURA.	49. Guaicura, Vaicura or Monqui. 50. Aripa. 51. Uchita. 52. Cora. 53. Concho or Lauretano.....	
	VIII. COCHIMI-LAIMON.	54 to 57. Cochimi, divided into four sister languages, viz.: Cadegomo and the languages used in the missions of San Javier, San Joaquin, and Santa Maria..... 58. Laimon or Layamon.....	
	IX. SERI.	59. Seri or Ceri..... 60. Gualma or Gayama..... 61. Upanguaima.....	
	X. TARASCA.	62. Tarasco..... 63. Chorotega de Nicaragua.....	
	XI. ZOQUE-MIXE.	64. Mixe..... 65. Zoque..... 66. Tapijulapa.....	Various.

GROUPS.	FAMILIES.	LANGUAGES.	DIALECTS.
FAMILIES INDEPENDENT AMONG THEMSELVES AND OF THE MEXICAN-OPATA GROUP.	XII. TOTONACA.	67. Totonaco (mixed language).....	Four.
		2d Order. Languages polysyllabic polysynthetic of juxtaposition.	
	XIII. MIXTECO-ZAPO- TECA.	68. Mixteco..... 69. Zapoteco..... 70. Chuchon..... 71. Popoloco..... 72. Cuicateco..... 73. Chatino..... 74. Papabuco..... 75. Amusgo..... 76. Mazateco..... *77. Solteco..... *78. Chinanteco.....	Eleven. Twelve. Two. Two. Two.
	XIV. PIRINDA OR MATLALZINCA.	79. Pirinda or Matlalzinca;.....	Various.
		3d Order.—Languages Polosyllabic Synthetic.	
	XV. MAYA.	80. Yucateco or Maya..... 81. Punctunc..... 82. Lacandon or Xochinel..... 83. Peten or Itzae..... 84. Chanabal, Comiteco, Jocolobal..... 85. Chol or Mopan..... 86. Chorti or Chorte..... 87. Cakchi, Caichi, Cachi or Cakgi..... 88. Ixil, Izil..... 89. Coroh..... 90. Quiché, Utlateco..... 91. Zutuhil, Zutugil, Atiteca, Zacapula..... 92. Cachiuel, Cachiquil..... 93. Tzotzil, Totzil, Tzinanteco, Cinanteco..... 94. Tzendal, Zendal..... 95. Mame, Mem, Zaklohpakap..... 96. Poconchi, Pocoman..... 97. Atche, Atchi..... *98. Huasteco..... *99. Hattiano, Quizqueja or Ita, with their af- finities, Cubano, Borigua and Jamaica.....	Various.
	XVI. CHONTAL.	*100. Chontal doubtful in its morphologic char- acter.....	
	XVII. DERIVATIVES OF NICARAGUA.	*101. Huave, Huastoteca..... *102. Chiapaneco.....	
	XVIII. APACHE.	103. Apache.....	North American Apache, Mexi- can Apache, Mimbresño, Pinaleno, Nava- jo, Xicarilla or Faraon, Lipan Mescalero.
		4th Order.—Languages cuasi-mo- nosyllabic.	
	XIX. OTOMI.	104. Otomi or Hiahiu..... 105. Serrano..... 106. Mazahua..... 107. Pame..... 108. Jonaz or Meco. (Perhaps the rest of the ancient Chichimeco).....	Various.

POPULATION.

We have until recently taken a regularly correct census of our population. The first reliable census was made in 1795, under Revil-lagigedo's viceroyalty, the second in 1810 by Don Fernando Navarro y Noriega, the third one was estimated by Mr. Poinsett, United States Minister in Mexico, in 1824, and the others have been taken by the Mexican Government.

The following is a statement of the general results of our various censuses :

Years.	Inhabitants.
1795.....	5,200,000
1810.....	6,122,354
1824.....	6,500,000
1839.....	7,044,140
1854.....	7,853,395
1869.....	8,743,614
1878.....	9,384,193
1879.....	9,908,011
1886.....	10,791,685
1895.....	12,570,195

The population of Mexico appears to be, from our last census, taken in 1895, 12,570,195, which would give 16.38 for each square mile ; but from my personal knowledge of the country, I am quite sure that it is not less than 15,000,000. It is very difficult to take a correct census in Mexico, because there is not the proper machinery in operation for that purpose, and especially because a great many districts are inhabited by Indians, who are impressed with the fear that if they inscribe themselves in the census they will be taxed or drafted into the military service, and they try to avoid registration.

A great many of our people live in such remote districts that they are practically cut off from communication with other portions of the country, and in fact are almost isolated ; and this constitutes still another difficulty in the way of taking a correct census. These people generally raise everything they need for their living, as well as for their clothing. They also raise their domestic animals, and wear either cotton or woollen clothes, manufactured by the women. The configuration of the country, which makes transportation very expensive, together with the very sparse population, has caused their isolation, and this explains why some agricultural products which are very cheap in other countries are very dear in certain districts of Mexico, as prices can be easily controlled, there being no possibility of competition. While sugar, for instance, costs 25 cents per pound in some districts, it can be had in others for one cent. This fact shows also that a year of good crops was often a real misfortune to these districts.

The upper lands being the healthiest, most of the population in Mexico is settled in the central plateau ; a relatively small portion lives in the temperate zone, while the torrid zone is very thinly populated. I imagine, at a rough calculation, that about 75 per cent. of the population make their abode in the cold zone, from 15 to 18 per cent. in the temperate zone, and from 7 to 10 per cent. in the torrid zone.

From the synopsis of our censuses, inserted above, it appears that the population in Mexico has duplicated during the last century, and although that increase does not keep pace with the increase in the United States, because this has been really wonderful, it compares favorably with the increase in other countries. Mexico also, as a new country and one full of possibilities, ought to have increased its population more rapidly, but its slow progress can be accounted for in several ways.

Under the head of Ethnology I enumerated the different races inhabiting Mexico and stated the number of inhabitants belonging to each, and I gave at length the reasons for the slow increase of the Indian population, which is the largest in Mexico. I will only add here that while the Indians lead a very abstemious and simple life, marry while very young and generally have a family of several children, they are at the same time subject to epidemics. Notwithstanding that the race on the whole is sturdy and little subject to disease, the mortality is very large among the children for want of proper nutrition and care. The losses caused by our civil wars could not at all explain the slow increase of our population, and the only way in which I can account for it is that they are not so well prepared as the people of the United States and other more advanced countries, to bear the discomforts of life and climate, and that, therefore, they cannot bring up all the children born in the family, among whom there is annually a great mortality.

Classification of Mexican States. Under the Spanish rule Mexico was divided into several provinces, the Spaniards trying to divide the provinces in accordance with the different nationalities of the aborigines found there, and each province possessing a very large extent of territory. After our independence and when we established a Federal government, each province was made a state, and since then some of the largest states have been divided into two or even three smaller ones. In the chapter on Political Organizations I shall give further information on this subject.

The Mexican states are classified in several ways, and generally as Northern, Southern, Central, Pacific, and Gulf States ; but it is difficult to make a proper division of them, because there are several included in two denominations. I will, therefore, divide them into Northern States, calling so those bordering on the United States ; Southern States,

those bordering on Gautemala and Belize ; Gulf, Caribbean Sea, and Pacific States, those bordering on their respective waters ; and Central States those which do not belong to any of the above denominations, although I do not consider this a proper classification, because the State of Tamaulias included among the Northern States, and the States of Tabasco, Campeche, and Yucatan among the Southern States, are all on the Gulf of Mexico, and are, therefore, Gulf States, the latter being also washed on their southern side by the Caribbean Sea, and the State of Sonora, classified as a Northern State, borders on the Pacific ; the State of Chiapas, included among the Southern States, also borders on the Pacific, and, therefore, is, like Sonora, also a Pacific State.

Our last official census, taken in 1895, gives the following results by States, which I compared with the census of 1879.

AREA AND POPULATION OF THE UNITED MEXICAN STATES.

STATES.		AREA IN SQUARE MILES.	POPULATION		POPULA- TION PER SQUARE MILE.	CAPITAL.	POPULA- TION.
			in 1879.	in 1895.			
Northern States bordering on the U. S.	Tamaulipas	32,585	140,137	204,806	6.3	Ciudad Victoria..	14,575
	Nuevo Leon.	24,324	203,284	309,607	13.1	Monterey.....	56,855
	Coahuila	62,376	130,026	235,638	3.7	Saltillo	19,654
	Chihuahua	87,820	225,541	266,831	3.0	Chihuahua	18,521
	Sonora.....	76,922	115,424	191,221	2.4	Hermosillo	8,376
Southern States bor- dering on Guate- mala.	Yucatan.....	35,215	302,315	297,507	8.4	Mérida.....	36,720
	Campeche.....	18,091	90,413	90,458	5.0	Campeche.....	16,631
	Tabasco.....	10,075	104,747	134,794	13.3	S. Juan Bautista..	27,036
	Chiapas.....	27,230	205,362	313,678	11.5	Tuxtla Gutierrez.	7,822
At- lantic.	Veracruz.	29,210	542,918	855,975	29.3	Jalapa.....	12,173
Pacifc.	Oaxaca.....	35,322	744,000	882,529	24.9	Oaxaca	32,641
	Guerrero.....	25,003	225,500	417,621	16.7	Chilpancingo.....	6,204
	Michoacan.....	22,881	661,534	889,795	38.8	Morelia.....	32,227
	Colima.....	2,273	65,827	55,677	24.5	Colima.....	19,305
	Jalisco.....	31,855	983,484	1,107,863	34.8	Guadalajara.....	83,870
	Sinaloa.....	33,681	186,491	256,414	7.6	Culiacan	14,205
Central.	Aguascalientes....	2,951	140,430	103,645	35.1	Aguas Calientes..	31,619
	Durango.....	38,020	190,846	294,366	7.7	Durango.....	42,165
	Guanajuato	11,374	834,845	1,047,238	92.1	Guanajuato.	39,337
	Hidalgo.....	8,920	427,350	548,039	61.6	Pachuca.....	52,189
	Morelos.....	2,774	159,160	159,800	57.6	Cuernavaca	8,554
	Mexico.....	9,250	710,579	838,737	90.7	Toluca.....	23,648
	Puebla.....	12,207	784,466	979,723	80.2	Puebla	91,917
	Querétaro.....	3,558	203,250	227,233	63.9	Querétaro.....	32,790
	Tlaxcala	1,595	138,988	166,803	104.6	Tlaxcala.....	2,274
	San Luis Potosí..	25,323	516,486	570,814	22.5	San Luis Potosí..	69,676
	Zacatecas.....	24,764	422,506	452,720	18.2	Zacatecas.	40,026
Territ- ories.	Tepic.....	11,279	.....	144,208	12.8	Tepic.....	16,266
	Lower California..	58,345	30,208	42,227	0.7	La Paz and	4,737
	Federal District ..	463	351,804	484,608	1046.7	Ensenada de Todos Santos ..	1,259
	Islands.....	1,471	.....	.....	.....	City of Mexico...	339,935
Totals.....		767,226	9,908,011	12,570,195			

RELIGION.

All Mexicans are born in the Catholic Church, that being the prevailing religion of the country ; but there is no connection between Church and State, and the Constitution guarantees the free exercise of all religions.

While Mexico was a colony of Spain and for many years afterwards, the catholic religion was the only one allowed in the country, and anybody professing any other would expose himself to great hardships if he avowed that he was a dissenter, especially while the Inquisition was in existence.

The clergy became one of the principal pillars of the Spanish domination in Mexico. In the early part of the present century the Church was flourishing, and it was the high-water mark of clerical prosperity. The humble Mexican priests did the hard laborious work, while the Spanish-born ecclesiastics filled the great bishoprics and other great posts and lived at their ease, and the great convents in their most lucrative positions of control were practically in Spanish hands.

Huge convents occupied a considerable part of the site of the City of Mexico, Puebla, Morelia, Guadalajara, Querétaro, and other cities. The incomes of the convents were derived from endowments, amounting to a large sum. To support the high ecclesiastics, great sums were derived from tithes. The archbishop of Mexico had an income of \$130,000 a year; the bishops of Puebla, \$110,000; of Michoacan, \$100,000; and of Guadalajara, \$90,000. Meantime, the parish priests, who bore the brunt of Christian work among the masses, were living on very moderate sums. The Church erected in Mexico buildings which are remarkable for their dimensions and taste.¹

¹ Mr. Charles Dudley Warner in the Editor's Study of *Harper's Illustrated Monthly Magazine* for July, 1897, speaks in the following way of the church edifices in Mexico :

"Somebody of authority, by the way, ought to explain why Mexico has so many church edifices that go to the heart of the lover of beauty, and why the United States has so few that are interesting. Aside from the great Gothic monuments in Spain, Mexico surpasses Spain in interesting ecclesiastical architecture. It has more variety, more quaint beauty, more originality in towers and façades. The interiors are generally monotonous, and repetitions of each other. The Spaniards, in an age of faith, built churches, convents, monasteries, all over the country, in remote and unimportant Indian villages, and as far north as their patient ministers of religion wandered, even to the bay of San Francisco. In these edifices the Spanish ingenuity and enthusiasm prevailed, but they were largely executed by Indian builders and artists; and if there is Sarazenic feeling shown, there are also, especially in ornamentation, traces of that aboriginal artistic spirit which, long before the Spanish conquest, executed both in stone and in pottery singularly attractive work. Even within a hundred years of our own time Indian genius has been distinguished. Those who think that this genius is only exhib-

Not all the great dignitaries of the Church exhibited an unchristian selfishness, for many often spent their income in pious and charitable works, and in prosecuting missionary undertakings among the Indians of the remote distances.

The wealth of the Church was loaned out at a moderate rate of interest to landed proprietors, who formed the moral support of the Church among the laity and whose influence was prodigiously strong. The wealth of the Church was mostly in mortgages, while it held a large amount of real estate. In the City of Mexico and other places, the clergy owned a large portion of the real estate and held a great many mortgages, and, to its credit be it said, was not at all usurious, exacting only a fair rate of interest and being hardly ever oppressive in dealing with delinquent debtors.

After the Revolution which effected the independence of the country, the ecclesiastical life began to cease having many of the attractions it had before. While many men became friars from genuine inclination and vocation, not a few went into the religious life because it gave them support without hard labor, and because it was one of the best careers opened to young men at the time.

The nunneries sheltered a great many pious women, who effected some good as educators of the young, as almoners for the wealthy, and as nurses of the sick. There were abuses, of course, but on the whole the religious life afforded a refuge for many thousands of good women who felt drawn to works of charity and usefulness. Rich young girls were often over-persuaded to enter the convents, by avaricious and scheming priests, but such abuses are common to all religions. The Liberal party thought that the best way to destroy the Church influence in Mexico was to suppress convents, both of friars and nuns, because they

ited in bizarre forms, and in such small details of design and color as the potter can attain, should see at Querétaro the work of Tresguerras, architect, sculptor, and painter. Any modern architect, who is led away by straining after effect in a grotesque combination of distinct Greek styles with mediæval and early English, having no note of originality anywhere, could study with profit the simple elegance—as simple as the Old Louvre—of the Bishop's Palace in Querétaro, or the wood-carving in the church of the sequestered Convent of Santa Rosa. In my remembrance there is not, on such a great scale, any wood-carving in the world equal to it in freshness and largeness of execution and in beauty of design. It could not have been all done by the hand of Tresguerras, but it was all from his designs and under his superintendence. Of course, as to civic and ecclesiastic architecture, climate and lack of popular taste for the beautiful put limits upon our architectural work, but it is worth the while of the American architect to consider whether he cannot learn more from our sister republic below the Tropic of Cancer than he is likely to get from the well-studied structures of Europe. In many petty and poverty-stricken Indian villages are charming towers and curious façades which would be a most valuable education in the principles of taste to any American community."

were considered a nest of superstition, and they thought that the best interest of the country required to close them.

During our civil wars the clergy contributed large amounts to the support of the conservative governments, which it often established. It is thought that in 1853, General Santa Anna abandoned the Conservative Government, which he then presided over, because the Archbishop of Mexico did not give him all the money he required to carry on the war waged against him by the Liberal party.

The wealth accumulated by the Church of Mexico was used for the purpose of supporting the conservative governments, whose policy was to keep the statu quo, and was therefore opposed to progress of any kind. The Church became a very prominent factor in politics, and could upset and establish governments at its pleasure, fomenting the many revolutions which were constantly breaking out. It was thought necessary, therefore, to destroy the political power of the Church before we could establish and maintain peace, and that work was done by what we call our Laws of Reform, issued in 1859, which established a complete independence between the Church and the State, and were intended to completely end the domination of the Catholic Church in civil affairs in Mexico: the Church property was confiscated, so that even the houses of worship are now the property of the government; all convents of friars and nuns were closed, all religious ceremonies—such as processions and wearing a distinctive dress,—were ordered to be confined to the interior of the edifices; the cemeteries were secularized, and marriage made exclusively a civil contract. No religious instruction or ceremony is allowed in the public schools, and never is a prayer offered as a part of the program of a national celebration. In an article, which I published in the *North American Review*, of January, 1895, entitled "The Philosophy of the Mexican Revolutions," I dwelt especially on this subject, and to that article I refer the reader who may desire more detailed information.

The Liberals were not the first to dispose of the Church property and revenues, as the Spanish Government, under the rule of Godoy, in 1805 and 1806, to secure funds to form a redemption provision for the royal *vales* or credit notes, pounced on the property of the Church in Mexico, and that, later on, when the Mexicans rose in their war for independence, the royal authorities took another part of the Church's wealth to fight the patriots.

The bigoted Catholic element which used to be decidedly opposed to any liberal government and was always conspiring to overthrow it, has since the downfall of Maximilian, become satisfied that the condition of things has changed having accordingly changed their course, and now there are thousands of progressive catholics in Mexico sincerely devoted to their Church, who see only danger and eventual

disastrous defeat in the adoption of a program of reaction. They go with the times and support the administration of Gen. Diaz because, on the whole, it suits them, and manifests no hostility to their conscientiously held convictions. The pope's influence seems to be directed to assuaging ancient rancors, and to the calming of passionate resentments, which is a great deal better for the Church.

Protestantism in Mexico.—The Liberal party proclaimed as an inherent right of man, freedom of conscience and the free exercise of one's religion; but the question was really only a theoretical one, since excepting a few foreigners, no one in Mexico had any other religion than the Catholic. The clergy, the Church party, and all strict Mexican catholics were greatly opposed to the introduction of Protestantism, because protestants were looked upon as heretics whose purpose was to divide the Mexican people into different sects, disturbing their religious unity, which they considered a source of national strength, and ultimately aiding in what some Mexicans fear is the aim of this country, that is: the final absorption of Mexico. When the struggles between the Liberal and the Church party terminated in favor of the former in 1867, with the withdrawal of the French army from Mexico and the downfall of Maximilian, the time came to put into practice the principles of the Liberal creed, and protestant organizations in the United States sent missionaries to Mexico for the purpose of establishing and propagating the protestant religion there. The Mexican Government could not refuse to allow the missionaries the free exercise of the Protestant or any other faith, because that right was guaranteed to all men in our constitution, and also because it has been a principle for which the Liberal party had been contending during many years.

But we went, then, further than allowing the Protestants the free exercise and preaching of their religion, and as I am in a measure responsible for that step, I think it proper to give my reasons for the same. My opinion has never been favorable to missionary work, because although I recognize that some religions have higher moral principles than others, I think that on the whole they are all intended to accomplish the same purpose, that all are good, when practised in good faith. It has always seemed to me that Christian missionaries sent to heathen countries would be looked upon in the same manner as would be heathen missionaries sent to Christian countries. But even supposing that it should be proper and desirable for the Christian religion, on account of its high morals and principles, to send missionaries to heathen countries for the purpose of converting them to Christianity, that principle would scarcely hold good in Christian countries of different denominations, and Catholicism is a Christian religion—whatever abuses it may have committed,—and I think the natural tendency

of all religions when they are predominant is to absorb and misuse power ; but that Protestants should send missionaries to a Catholic country seems to me inconsistent. In principle, therefore, Mexico is hardly the proper field for Protestant missionaries, notwithstanding that there is a great deal of room for improvement there, in so far as religious matters are concerned.

After having witnessed the terrible consequences of religious intolerance and political domination of the Catholic Church in Mexico, I was of course greatly impressed with the condition of things existing in the United States, where all religions are tolerated and none attempts to control the political destinies of the country. I thought that one of the best ways to diminish the evils of the political domination and abuses of the clergy in Mexico was to favor the establishment of other sects, which would come in some measure into competition with the Catholic clergy and thus serve to cause it to refrain from excesses of which it had been guilty before. When, after having lived for ten years in the United States, from 1859 to 1868, I returned to Mexico and took charge of the Treasury Department there, just at the time when the religious question was being solved, I, therefore, favored the establishment of a Protestant community as planned by Mr. Henry C. Riley, since made a Bishop, a gentleman of English parentage, born in Chili, who had been educated in London and New York and was graduated with high honors at Columbia College, New York, who spoke equally well English and Spanish, and eagerly desired to establish a Mexican National Church in competition with the Roman Catholic, in which undertaking, I understand, he used his own funds. He proposed to buy one of the finest churches, the main church of the Franciscan convent, which had been built by the Spaniards, located in the best section of the City of Mexico, and which could not now be duplicated but for a very large amount of money ; and with the hearty support of President Juarez, who shared my views and who was perhaps a great deal more radical than I was myself on such subjects, I sold the building which had become national property after the confiscation of the Church property, for a mere trifle, if I remember rightly about \$4000, most of that amount being paid in Government bonds which were then at a nominal price.

The magnificent building sold to Dr. Riley's community was bought recently by the Catholic Church to restore it as a Catholic temple, for the sum of \$100,000, as I understand. My assistance was rendered to the Protestant cause for the reasons that I have stated, and not because I had adopted the Protestant faith ; therefore the action of the Mexican Government in the matter at the time I speak of, was all the more praiseworthy. Dr. Butler bought about the same time another part of the same convent of San Francisco, where he established a Methodist Church in a very creditable building.

It is true that a great many Mexicans, namely the Indians, do not know much about religion and keep to their old idolatry, having changed only their idols, that is, replaced their old deities with the images of the Saints of the Catholic Church, but it would be difficult for the Protestant missionaries to reach them. The Spaniards labored zealously to make the natives adopt the Catholic religion, and although they succeeded wonderfully, it was a task too difficult to fully accomplish in the three centuries of the Spanish domination in Mexico.

I do not think that the American Protestant missionaries in Mexico have made much progress, and I doubt very much whether Mexico is a good field for them ; but they are satisfied with their work, and they think that under the circumstances, they have made very good progress.

The number of Catholic churches and chapels in the country was, in 1889, 10,112, while the number of Protestant places of worship was 119. On August 12, 1890, there were in the municipality of Mexico 320,143 Catholics and 2623 Protestants.

The American missionaries, and especially Dr. Riley, whom I consider a very benevolent and unselfish man, have established Protestant schools and asylums for children, spending considerable money in maintaining such institutions. Of course poor parents were glad to send their children to the Protestant schools and asylums when they could not afford to keep them at home or send them to more desirable places, and these Protestant institutions were of a very benevolent character and worthy, therefore, to be encouraged. Parents in such cases declared themselves to be partial to Protestantism, but only for the sake of having their children accepted in the Protestant schools and asylums, and this made the Protestants think they were making a great many converts.

Now and then a Catholic priest would renounce Catholicism and accept Protestantism, and such occurrences were always considered as great triumphs for the Protestant cause, but although in some instances such changes have been made in good faith, in others they were made for selfish purposes, and they never had any great weight with the community.

I have no prejudice against Protestantism ; on the contrary, I admire greatly many of its principles, and in speaking on this subject I consider myself perfectly impartial and unbiassed.

In February, 1888, the Evangelical Assembly, representing the various Protestant denominations and Evangelical Societies conducting missionary operations in the Republic of Mexico, was held in the City of Mexico. They claimed that, notwithstanding the difficulties of language and climate and the other obstacles with which they had to contend, they found that they had over 600 congregations, 192 foreign and 585 native workers, over 7000 in the day schools, and about 10,000

in the Sunday-schools, 18,000 communicants and a Protestant community of over 60,000 souls. Ten small publishing-houses are turning out millions of pages each year, and their church property is valued at nearly a million and a quarter dollars in silver.

POLITICAL ORGANIZATION.

Mexico was the largest and richest American colony of Spain, and for this reason it was called New Spain. The City of Mexico grew during the Spanish rule to be larger than Madrid, the capital of the Spanish Kingdom, the population of the country being estimated in 1810, just before the independence movement began, at 6,122,354; while the public revenue of the whole colony amounted to the very large sum of \$20,000,000 yearly, the only exports of the country being silver and gold, and commodities of great value in small volume and weight, such as cochineal, vanilla, indigo, and a few others.

Mexico accomplished her independence in 1821, and since then has had two Federal Constitutions, both modelled after the Constitution of the United States; two Central Constitutions, which organized the country into a centralized republic, and two ephemeral empires, one under Iturbide, lasting ten months, from 1822 to 1823, and the other under Maximilian, established by French intervention, lasting from 1864 to 1867.

Mexico is now organized, under the Constitution of the 5th of February, 1857, with its several amendments, into a Federal Republic, composed of twenty-seven states, two territories, and a federal district, and the political organization is almost identical with that of this country. The powers of the Federal Government are divided into three branches—Legislative, Executive, and Judicial. The Legislative is composed of a House of Representatives and a Senate; the members of the House are elected for two years and the senators for four, the Senate being renewed by half every two years. Representatives are elected by the suffrage of all male adults, at the rate of one member for every 40,000 inhabitants. The qualifications requisite are to be at least twenty-five years of age and a resident of the State; and for senators thirty years.

The Executive is exercised by a President elected by the electors popularly chosen, who holds his office for four years, without any provision forbidding his re-election. He has a cabinet of seven members, namely: Secretary of Foreign Affairs, of the Interior, of Justice and Public Instruction, of Fomento, which means promotion of Public Improvements, and includes public lands, patents, and colonization; of Communications and Public Works, of the Treasury, and of War and Navy. No Vice-President is elected, but by an amendment to our Constitution, promulgated April 24, 1896, in the per-

manent or temporary disability of the President, not caused by resignation or by leave, the Secretary of State, and after him the Secretary of the Interior, shall exercise that office until Congress elects a President *pro tempore*. In case of resignation, Congress, accepting it, elects a President *pro tempore*, and in case of leave the President recommends to Congress the person to fill that office.

The Federal Judiciary is composed of a Supreme Court, consisting of eleven Judges, four substitutes, one Attorney-General, and one Fiscal, chosen for six years; three Circuit and thirty-two District Courts.

The States are independent in their domestic affairs, and their governments are similarly divided into three branches : the Governor, the Legislature, and the State Judiciary.

As we adopted the federal system rather to follow the example of the United States than to suit the conditions of Mexico, that system did not work with us so easily or so satisfactorily as it works here ; and the tendency is rather to centralization and to the increasing of the powers given by the Constitution to the Federal Government. In the article above mentioned published in the *North American Review*, for January, 1896, entitled, "The Philosophy of the Mexican Revolutions,"¹ I dwelt particularly on the results of our having copied almost literally the political institutions of the United States, and gave a general idea of our political condition.

Political Division.—When the federal system was established in Mexico, in 1824, each of the old provinces under the Spanish rule was organized as a State, and our Constitution of October 4, 1824, enumerated nineteen States. After the war with the United States we lost Texas, New Mexico, and California ; but since then as I stated in the chapter on population some of the larger States have been divided into two, or even three States, as was the case with the old State of Mexico, out of which were formed the three present States of Mexico, Hidalgo, and Morelos. Our present Constitution, of February 5, 1857, enumerates twenty-four States ; but we now have twenty-seven.

The tabular statement published above, under the head of "Population," shows the number of States which form the Mexican Confederation, their area, population, and capital cities.

Army and Navy.—During our civil wars, and for some time later, we had to keep a very large standing army, and our army acquired recently a very high degree of discipline and efficiency. The Liberal party always favored the reduction of the army, while the Church party favored a large army, as our old regular army, on the whole, took sides with the Church. Soon after the restoration of the Republic, in 1867, the Mexican army consisted of : Infantry, 22,964 ; engineers, 766 ; ar-

¹ This article will appear in this volume under the head of "Historical Notes on Mexico."

tillery, 2304 ; cavalry, 8454 ; rural guards of police, 2365 ; gendarmerie, 250 ; total, 37,103 ; and was commanded by 11 Major-Generals, 73 Brigadier-Generals, 1041 Colonels, Lieutenant-Colonels, and Majors, and 2335 Commissioned Officers. The total fighting strength, including reserves, is stated to be 132,000 infantry, 25,000 cavalry, and 8000 artillery. Every Mexican capable of carrying arms is liable for military service from his twentieth to his fiftieth year.

Notwithstanding that General Diaz is himself a soldier, he has followed the policy of the Liberal party of reducing the army as much as possible, and in his report of November 30, 1896, in which he informs his fellow citizens of his results of his sixteen years administration, he gives the following figures, showing the reduction he has been able to accomplish in the army since 1888 :

The army had, in 1888, according to President Diaz's report, the following personnel :

Major-Generals.....	16
Brigadier-Generals	84
Commissioned Officers.....	1,205
Non-Commissioned Officers.....	2,566
Soldiers	29,367
Total.....	33,238

In 1896 the personnel had been reduced in the following numbers :

Generals.....	24
Commissioned Officers.....	166
Non-Commissioned Officers	299
Soldiers	8,170
Total.....	8,659

The Mexican navy is now in its inception, as it consists of a fleet of two dispatch vessels, launched 1874, each of 425 tons and 425 horse-power, and severally armed with a four-ton muzzle-loading gun, and four small breech-loaders. A steel training ship, the *Zaragoza*, of 1200 tons, was built at Havre, in 1891 ; four gun-boats are building, and a battle-ship and cruiser are projected ; five first-class torpedo-boats have been ordered in England. The fleet is manned by ninety officers and five hundred men.

EDUCATION.

In 1521, the City of Mexico fell into the hands of the conquering Spaniards, and exactly eight years after that event there was established in the City of Mexico the College of San Juan de Letran, for giving secondary education to intelligent Indians as well as to the sons of the



invading race. Thus, ninety years before the landing of the Pilgrims, the City of Mexico had its "Harvard."

Universities Established by the Spanish Government.—The first viceroy of New Spain, as Mexico was called then, fourteen years after the conquest, petitioned the King of Spain to permit him to found a university in Mexico, and, anticipating from his knowledge of the good-will of the Spanish-rulers that the desired permission would be given, the viceroy took the responsibility of establishing certain classes in the higher learning, a fact which does not support the commonly held theory that Spain has always been the enemy of education and of popular enlightenment. Owing to the slow means of communication in those days, and the legal steps necessary to be taken in the mother country, the university was not formally established until 1553, or eighty-three years before Harvard College was opened. The great event of setting on foot the university came under the enlightened rule of the second viceroy, Don Luis de Velasco, who did so many great things for Spain's new dependency.

Later on, in 1573, there were founded in Mexico the colleges of San Gregorio and San Ildefonso, the latter still open, but modernized into the national preparatory school, a really great institution in that city of many schools. A few years later, long before the 17th century had dawned, came the founding of two more colleges and a divinity school, so that in the first sixty-five years of Spain's control in Mexico no less than seven seats of the higher learning had been established on secure foundations.

No wonder that Mexico's capital became known as the Athens of the new world, producing men of great learning, such as Don Juan Ruiz de Alarcon and such notably erudite women as Juana Inez de la Cruz. The extensive library of "Americana," belonging to Don Jose de Agreda, of that city, containing over 4000 books, many of them invaluable, attests the literary, antiquarian, scientific and artistic activity of the Spaniards who planted there in a short space of time so much of learning and such vast institutions dedicated to the instruction in all the higher branches of knowledge.

At the outset the University of Mexico gave instruction only in mathematics, Latin and the arts. Medicine and surgery were not esteemed highly during the middle ages, and it was not until long after the revival of learning in the Renaissance that the physician came to be considered as a true man of science. So it is not to be marvelled at that the University of Mexico waited until 1578 to establish a chair of medicine—the first in the new world discovered by Columbus. The first chair of medicine was a morning class, and a single professor carried his students through a four years' course unaided. In 1599, a second medical professorship was added; in 1661, anatomy and surgery

were added, and, consequently dissection was authorized. At the outset the viceroys appointed the professors, but after a time the candidates for chairs had to win the coveted prizes through competitive examinations.

The early students were not railroaded through. They had to study four years to obtain the diploma of a bachelor of medicine; then went out into active life, and, on gaining practical knowledge, received, passing a fresh examination, the diploma of licentiate of medicine, and, later, that of doctor of medicine.

School of Medicine.—In 1768 a decree was issued for the establishment in the City of Mexico of a royal college for surgeons, similar to institutions in Cadiz and Barcelona. This college was a very complete one, instruction being given in anatomy and dissection, in physiology, operations, clinical surgery, and medical jurisprudence. There were graduated also from the college all the dentists, bone-setters, phlebotomists, and midwives. A knowledge of Latin was not essential to receive a medical degree until 1803.

In 1821, Mexico having achieved her independence, the same careful watch over education continued, and in 1833 a general revision of educational institutions was ordered under the administration of Don Valentin Gomez Farias a leader of the Liberal party and the university was closed, because it was considered to have conservative tendencies, and a general board of education organized, which, among other things established what was called the School of Medical Science, with ten professors, giving a remarkably complete and modern course. On account of a revolution which occurred in 1834 which overthrew the Gomez Farias Government, the new school of medicine was closed, and the old university reopened; but, as the officials of the university, on making a careful study of the conditions of the new school of medicine rendered an impartial report, setting forth its manifold advantages it was decided to keep open the institution.

The incessant revolutions and consequent changes of government brought many evil things to pass, and the medical professors at times found themselves without salaries, and nobly devoted themselves to their classes without remuneration. They at one time were deprived of their building and literally thrown into the street. Better times came, however, the successive governments began to give substantial aid to the school, and in 1845 it took the name it still bears, the National School of Medicine. After more vicissitudes, many movings and trials which bore hard on the enthusiastic professors, the National School of Medicine finally was located where it now remains, in a part of the enormous edifice belonging formerly to the Inquisition.

In the chaos of succeeding revolutions the salaries of the professors were often unpaid, but the devoted men of science struggled on,

assisted by wealthier students and contributing often out of their own slender means to keep the school alive ; but, in 1857, a better era commenced, and not since then, with rare exceptions, have there been any interruptions in financial aid from the various governments. All the other institutions of learning suffered the same fate and were exposed to similar ups and downs.

School of Engineering.—Our mining college is the best in Spanish America, and it was established when engineering was hardly taught, and endowed by a portion of the taxes levied by the Spanish Government on mines. Its edifice is one of the best built by the Spaniards in their colonies, and still stands as a great monument, embellishing the City of Mexico.

The above given facts will show how early did Mexico open great schools for the higher education, and how solicitous was the Spanish government to maintain them. But, three centuries of devotion to learning, antedating the war for independence, planted there firmly a love of knowledge which is now exhibited in the great government schools, in a city full of students, in innumerable private schools, in the well-filled public primary institutions, in night schools for adults, and in the thirty-five bookstores of that city.

Mexican Technical Schools in the Present Time.—The edifice of the first University in America, founded by the Spanish crown in 1551, is to-day occupied by the National Conservatory of Music. The National Academy of Art, ancient Academy of San Carlos, stands where Fray Pedro de Gante founded, in 1524, the first school of the New World—a school for Indians. The Normal School for males, with its six hundred pupils and its first-class German equipment, occupies the old convent of Santa Teresa, (1678). The Normal School for females has fourteen hundred pupils, an expensive building of 1648. The fine old Jesuit College of San Ildefonso, erected in 1749 at a cost of \$400,000 is now filled with a thousand pupils of the National Preparatory School. The National College of Medicine is housed in the old home of the Inquisition (1732), an edifice whose four hanging arches at each corner of the lower corridor are famous. The building was taken for its present purpose in this century, the Holy Office dying in America with the Independence, but the medical college was established by royal decree of 1768. It has now several hundred pupils. San Lorenzo (1598) is now the manual training-school where poor boys are gratuitously taught lithography, engraving, printing, carpentry, and many other trades. The similar institution for girls is of course modern, dating only from 1874. The National Library, with its 200,000 volumes, dwells in the splendid sequestered Church of San Agustin. The National Museum occupies part of the million-dollar building erected in 1731 for the royal mint. And so on

through a list that would rival that of any other country. The School of Mines and Engineering, however, stands as one of the first. Its magnificent building of Chiluca, the nearest to granite the valley affords, was built for it by Tolsa in 1793, and cost three millions. The institution named the Colegio de la Paz, better known as the Vizcainas is one of the principal establishments for the education of young women, founded in 1734, at a cost for construction alone of about \$2,000,000, subscribed by three Spanish merchants, who also provided funds for its support. These funds, when insufficient to meet expenses, are supplemented by the Federal Government. We have also a very high grade Military School located at the historical grounds of Chapultepec, which educates fine soldiers.

As late as 1824 Humboldt declared, "No city of the New Continent, not excepting those of the United States, presents scientific establishments so great and solid as those of the capital of Mexico." Except as to the buildings, of course, so much could not be said to-day, as wealth and numbers have made other countries take more rapid strides in higher education. Some of the universities of the United States pay even \$10,000 a year to professors and they therefore can secure the best talent.

From the time of the Spanish domination in Mexico to but a few years ago, the Mexican Government considered itself bound to give to the people free secondary education, and for this purpose colleges for all literary and scientific professions were established in the City of Mexico, and each State did the same in its respective capital, in so far as its means allowed it, so that anybody who intended to follow a scientific career could do so without any expense to himself.

The result of the free technical schools has been that most of the young men of well-to-do families in Mexico follow a literary career and that does not cost them anything, and we have more lawyers, doctors, engineers than we really need for the country.

Reorganization of the Technical Colleges.—We had before 1868 several higher colleges and in each of them the same careers were taught, as law, medicine, engineering, etc., but in the reorganization of our national colleges which took place in that year, it was thought proper to establish a special college for each career, and a preparatory college for such elementary studies as would be required for all careers, such as elementary mathematics, physics, chemistry, etc., etc., so that we now have in the City of Mexico, supported by the Federal Government a special school for engineering, one for law, one for medicine, another for agriculture, etc., etc., but each State generally supports one technical college where all literary careers are taught.

Primary Education.—Comparatively little attention was paid to the primary education, and the public schools were so deficient that

parents of some means did not send their children to them, but to private schools where they were better attended to. The fact that the elevation of the people depends on their primary education has caused common schools to be established in the country, and now the States vie with each other for the purpose of establishing the best system of common schools and increasing their number.

The Mexican Government has been too much disturbed since its independence to earnestly promote the education of the Indians. I consider that one of the first duties of Mexico is to educate the large number of Indians which we have, and when that is accomplished the whole condition of the country will change, as it will be able in a few years to increase by several millions its productive and consuming population.

In 1896 the Federal Congress of Mexico passed a law which was promulgated on June 3d of that year, making primary education obligatory on all the inhabitants of the Federal District and Territories, and placing public education under the control of the Federal Government, having been before under the respective municipalities.

In almost all the States education is free and compulsory, but the law has not been strictly enforced. Primary instruction is mostly at the expense of the municipalities, but the Federal Government makes frequent grants, and many schools are under the care of the beneficent societies.

School Statistics.—Statistical reports on public instruction for 1876 showed an aggregate of 8165 primary schools, with an attendance of 368,754 children of both sexes throughout the Republic. Reports for 1895 show a total number of public schools for both sexes throughout the Republic amounting to 10,915, in which are instructed 722,435 scholars, at an aggregate cost of \$5,455,549.60. The proportion of children of both sexes attending the school is, with respect to the general population, nearly five per cent., and that of the children of school age, actually attending school about 27 per cent. with an average yearly outlay per capita of \$7.55. The entire number of private schools for both sexes, including those supported by religious and civil associations, is 2585, with a total attendance of 81,221. Adding these to the preceding figures we have an aggregate of 13,500 schools with an attendance of 803,656 scholars. The number of schools in the country for professional technical education is 136, attended by 16,809 pupils of both sexes.

In the Federal District there are 454 public primary schools with an attendance of 44,776 pupils, and 247 private schools with an attendance of 19,334 pupils. In the matter of education Mexico now stands upon a plane as high, if not higher, than any of the Spanish American Republics, out-ranking even Chili and the Argentine Republic, both of which greatly surpassed her in former years.

The statistical part of this paper will contain detailed information about the number of schools established in each State, their cost, etc., during the year 1895, which complements the information embraced in this chapter.

Libraries.—Many great and noteworthy public and private libraries attest the ineradicable love of learning characteristic of the Mexican people. In 1894 there were in the Republic the National Library, with 200,000 volumes, and 102 other public libraries. There were in that year 22 museums for scientific and educational purposes, and 3 meteorological observatories. Our National Library at the City of Mexico collected all the books possessed by the libraries of the different convents when they were suppressed by the National Government, and has therefore a very large number of rare and valuable books.

Newspapers.—The number of newspapers published was 363, of which 94 are published in the capital: 4 in English, 2 in French, and 1 in German, showing that the Press has not attained there the great development that it has in this country.

THE VALLEY OF MEXICO.

The Valley of Mexico is one of the finest spots in the world. Surrounded by high mountains—almost at the foot of the two highest in the country, Popocatepetl and Ixtaccihuatl—with a very rare and clear atmosphere and a beautiful blue sky, especially after a rain; it is really a centre of magnificent scenery. The rareness of the atmosphere makes distant objects appear to be very near, and when looking from the City of Mexico at the mountains which surround the Valley, one imagines that they are at the end of the City, while some of them are at a distance of forty miles. The view of the Valley from Chapultepec Hill, which is about one hundred and fifty feet high and distant about three miles from the City, towards its western extremity, where our military school now is and where the President has made his summer residence, is one of the most beautiful with which the earth is endowed. I have seen the Bosphorus, Constantinople, the Bay of Naples and other spots in the world which are considered to be most remarkable for their natural beauty, but I think the view of the Valley of Mexico from Chapultepec can be advantageously compared with any of them, if it does not excel them all.

Six lakes are within the limits of the Valley,—Chalco, Zochimilco, Texcoco, Xaltocan, San Cristobal, and Zupango, the two former being of fresh water and the others of salt water—and, as they have no natural outlet the City of Mexico has been deprived for some time of a proper drainage and its health has been affected very materially thereby. But the colossal undertaking of making an artificial outlet is

now practically finished. In an article which I published in the *Engineering Magazine* in January, 1895, I dwelt especially on the work done during four centuries to accomplish that great end.¹

The prevailing wind in the Valley of Mexico is northwest and north-northwest, which blew 250 times during the year 1883; while the southern winds, which are very dry, are rare, as they only blew 51 times in that year; but at the same time they have greater velocity than the others, and the greatest relative velocity of the winds is 3.0. The west and northwest winds are very damp.

At the present stage of industrial development, speaking especially of the Valley of Mexico, the question of a cheaper combustible is the one of supreme importance. In the absence of water-power of importance and permanence of volume, the only solution of the problem so vital to the growth of manufactures there lies in procuring abundant and cheap fuel.

THE CITY OF MEXICO.

The City of Mexico, located in the western end of the valley, on the Anahuac plateau, at an altitude of 7350 feet above the sea level in 19° 26' north latitude and 99° 07' 53" .4 longitude west of Greenwich, covering about twenty square miles, is one of the most ancient cities of this continent, was the capital of the Aztec Empire, of the Spanish Colony of New Spain and now of the Mexican Republic, and of the Federal District of Mexico.

Mexico dates either from the year 1325 or 1327, when the Aztecs, after long wanderings over the plateau were directed by the oracle to settle at this spot. For here had been witnessed the auspicious omen of an eagle perched on a nopal (cactus) and devouring a snake. Hence the original name of the city, Tenochtitlan (cactus on a stone), changed afterwards to Mexico in honor of the war god Mexitli. The eagle holding a snake in her beak and standing on a cactus upon a stone, is the coat-of-arms of the Mexican Republic. With the progress of the Aztec culture the place rapidly improved, and about 1450 the old mud and rush houses were replaced by solid stone structures, erected partly on piles amid the islets of Lake Texcoco, and grouped around the central enclosure of the great teocalli. The city had reached its highest splendor on the arrival of the Spaniards in 1519, when it comprised from 50,000 to 60,000 houses, with perhaps 500,000 inhabitants, and seemed to Cortes, according to Prescott's, "like a thing of fairy creation rather than the work of mortal hands." It was at that time about 12 miles in circumference, everywhere intersected by canals, and connected with the mainland by six long and solidly constructed causeways, as is clearly shown by the plan given in the edition of

¹ That article is appended to this paper.

Cortes's letters published at Nuremberg in 1524.¹ After its almost destruction in November, 1521, Cortes employed some 400,000 natives in rebuilding it on the same site; but since then the lake seems to have considerably subsided, for although still 50 square miles in extent, it is very shallow and has retired two and a half miles from the city.

During the Spanish rule the chief event was the revolt in 1692, when the municipal buildings were destroyed. Since then Mexico has been the scene of many revolutions, was captured by the United States Army after the battle of Chapultepec, on September 13, 1847, and by the French Army under Marshall Forey in 1863. But since the overthrow of Maximilian, and the French Intervention in 1867, peace has been established and it has become a great centre of civilizing influences for the surrounding peoples.

The City of Mexico is 263 miles by rail from Veracruz on the Atlantic, 290 from Acapulco on the Pacific, 285 from Oaxaca, 863 from Matamoros on the frontier with the United States, and 1224 miles from El Paso. Mexico is the largest and finest city in Spanish America, and at one time larger than Madrid, the capital of Spain, forming a square of nearly 3 miles both ways, and laid out with perfect regularity, all its six hundred streets and lanes running at right angles north to south and east to west, and covering within the walls an area of about ten square miles, with a population now of 539,935.

The present City of Mexico is almost twice as large as the old one, it having increased towards the northwest, and, strange to say, the new portion is not laid out as regularly as the old one. All the main thoroughfares converge on the central Plaza de Armas, or Main Square, which covers 14 acres, and is tastefully laid out with shady trees, garden plots, marble fountains, and seats. Here also are grouped most of the public buildings, towering above which is the Cathedral, the largest and most sumptuous church in America, which stands on the north side of the plaza on the site of the great pyramidal teocalli or temple of Huitzilopochtli, titular god of the Aztecs. This church, which was founded in 1573 and finished in 1657, at a cost of \$2,000,000, for the walls alone, forms a Greek cross, 426 feet long and 203 feet wide, with two great naves and three aisles, twenty side chapels, and a magnificent high altar supported by marble columns, and surrounded by a tumbago balustrade with sixty-two statues of the same rich gold, silver, and copper alloy serving as candelabra. The elaborately carved choir was also enclosed by tumbago railings made in Macao, weighing twenty-six tons, and valued at about \$1,500,000. In the interior, the Doric style prevails, and Renaissance in the exterior, which is adorned by five domes and two open towers 218 feet high. At the foot of the

¹ Reproduced in vol. iv. of H. H. Bancroft's *History of the Pacific States*, San Francisco, 1833, p. 280.

left tower was placed the famous calendar stone, the most interesting relic of Aztec culture, which is now at the National Museum.

The east side of the plaza is occupied by the old vice-regal residence, now the National Palace, with 675 feet frontage, containing most of the Government offices, ministerial, cabinet, treasury, military headquarters, archives, meteorological department with observatory, and the spacious halls of ambassadors, with some remarkable paintings by Miranda and native artists. North of the National Palace, and forming portions of it, are the post-office and the national museum of natural history and antiquities, with a priceless collection of Mexican relics.

Close to the cathedral stands the Monte de Piedad, or national pawnshop, a useful institution, endowed in 1744 by Don Manuel Romero de Terreros with \$375,000, and now possessing nearly \$10,000,000 of accumulated funds. Facing the cathedral is the Palacio Municipal, or City Hall, 252 feet by 122, rebuilt in 1792 at a cost of \$150,000, and containing the city and district offices, and the merchant's exchange.

Around the Plaza San Domingo were grouped the convent of that name, which contained vast treasures buried within its walls, the old inquisition, now the school of medicine, and for some time the Custom House, which has now been removed to the city boundary. In the same neighborhood are the Church of the Jesuits and the School of Arts, which is, in the language of Brocklehurst, "an immense workshop, including iron and brass foundries, carriage and cart mending, building and masonry, various branches of joinery and upholstery work, and silk and cotton hand-weaving."

Other noteworthy buildings are the national picture gallery of San Carlos, the finest in America, in which the Florentine and Flemish schools are well represented, and which contains the famous *Las Casas*, by Felix Parra; the national library of St. Augustine, with over 200,000 volumes, numerous MSS., and many rare old Spanish books; the mint,¹ which since 1690 has issued coinage, chiefly silver, to the amount of nearly \$3,000,000,000; the Iturbide Hotel, formerly the residence of the Emperor Iturbide; the Minería, or schools of mines, with lecture-rooms, laboratories, rich mineralogical and geological specimens, and a fossil horse, three feet high, of the Pleistocene period.

¹ The Spanish Government intended during last century to build a spacious, costly, and magnificent mint in the City of Mexico, and its plans and specifications were approved by the king, but by a mistake of the clerks in Madrid, they were forwarded to Santiago, Chili, instead of being sent to the City of Mexico, and it was in consequence built there. The building was so fine that, not having any mint at Santiago, it was used as the Government House, and it is now the Executive Mansion and Departments, and it is called "La Moneda," an abbreviation of "La Casa de Moneda," which is the Spanish name for mint.

Among the twenty scientific institutes, mention should be made of the Geographical and Statistical Society, whose meteorological department issues charts and maps of unsurpassed excellence.

Owing to the spongy nature of the soil, the Minería and many other structures have settled out of the perpendicular, thus often presenting irregular lines and a rickety appearance.

Before 1860 half of the city consisted of churches, convents, and other ecclesiastical structures, most of which have been sequestered and converted into libraries, stores, warehouses, hotels, and even stables, or pulled down for civic improvements. Nevertheless there still remain fourteen parish and thirty other churches, some of large size, with towers and domes. San Francisco Street is the leading thoroughfare, and is rivalled in splendor only by the new Cinco de Mayo Street, running from the National Theatre to the cathedral.

It would take a great deal more space than it is convenient to give in this paper, should I attempt to make a longer description of the City of Mexico which, being one of the oldest on this continent and the largest and principal one during the three centuries of the Spanish rule, it has quite a number of remarkable buildings and monuments and a very important history, a great deal of romance being connected with it.

The City of Mexico is not only the capital of the country, but the real head of the Republic ; and the aim of all other Mexican cities is to follow in its footsteps and imitate as much as possible the City of Mexico, which to them is a beau idéal and a real paradise.

The City of Mexico is now literally encircled with a belt of factories—cotton, paper, linen, etc., packing houses, brick works, cork factories, soap works, etc., and cheaper fuel will add largely to their number. They have been able to show profits under the load of a dear combustible, and they will welcome the introduction of any fuel, which will enable them to work even more successfully.

Climate.—From the official reports of Professor Mariano Barcena, Director of the National Meteorological Observatory of the City of Mexico, of the weather conditions in 1895, it appears that there were 121 cloudy days. But the rains were mostly at night or late in the afternoon, of short duration, and immediately succeeded by sunshine showers. Long periods of rainy weather are unknown there. The total rainfall for the year, less than twenty inches, will convey a fair idea of the dryness of the climate. The mean temperature in the shade for 1895 was 60 degrees, the highest being 65, reached in April, and the lowest 53, in January, a temperature rather which avoids both extremities. The mean temperature for the summer months were : June, 64 degrees ; July, 62 ; August, 62 ; September, 61.

The table on page 112, prepared by the Weather Bureau of the City.

of Mexico, contains the average annual climatological data of that city from the years 1877 to 1895.

More detailed data about the climatological conditions of the City of Mexico during the year 1896, prepared also by our Weather Bureau, is appended on page 113.

Mortality in the City of Mexico.—During the year 1896 the total mortality in the City of Mexico, under a recorded population of 330,698, was 15,567, not including 1275 still-births, equivalent to 4.70 per cent. The principal diseases which caused that mortality were those affecting

¹ A BRIEF HISTORICAL SKETCH OF THE METEOROLOGY IN THE MEXICAN REPUBLIC.

Priest José Antonio Alzate stands in the first place among those who have cultivated the meteorological science in our country, being he who first devoted himself to its study, and made regular observations during more than eight years, as he himself says in his *Descripcion topografica de México* (1738 to 1799). Of these observations, he, unfortunately, only published those belonging to the last nine months of the year 1769, in his famous *Gaceta de Literatura de México*, 1788 to 1795. He also published many articles describing some phenomena and instruments, climates of towns, value and usefulness of observations, as he had done in others of his publications: *Diario Literario de México*, 1768; *Asuntos varios sobre Ciencias y Artes*, 1772 to 1773; and *Observaciones sobre la Física Historia Natural y Artes útiles*, 1787. He was the first in determining the height of the City of Mexico.

After these labors of Father Alzate, we find in the journal *El Sol* regular series of observations published, daily, from the 14th of June, 1824, to the 14th of January, 1828. Dr. John Burkart in 1826; Sr. Francisco Gerolt from 1833 to 1834, at the School of Mines; Sr. José Gómez de la Cortina, Conde de la Cortina, from 1841 to 1845; the members of the Geographical Section of the Army Staff from 1842 to 1843; the Astronomer Sr. Francisco Jiménez in 1858; the School of Mines in the years 1850, 1856, 1857, and 1858; Sr. Ignacio Cornejo, M.E., at the same school from 1865 to 1866; and Sr. Juan de Mier y Terán at the "Escuela Preparatoria" from 1868 to 1875, respectively, made some meteorological observations.

A series of observations from 1855 to 1875 were made at the Hacienda de San Nicolás Buenavista, and another one at the city of Córdoba from 1859 to 1863, by Dr. José Apolinario Nieto; Sr. Carlos Sartorius at the Hacienda del Mirador (State of Veracruz); Sr. Miguel Velázquez de León, and his sons, Joaquín and Luis, engineers, from 1869 up to the present, at the Hacienda del Pabellón; Sr. Gregorio Barreto from 1869 to 1880, at the city of Colima; General Mariano Reyes, Sr. José María Romero, engineer, and Sr. Pascual Alcocer, from 1870 to the present date, at the city of Querétaro; Sr. Lázaro Pérez from 1874 to 1885, at the city of Guadalajara; Sr. Isidoro Epstein at the City of Monterrey, 1855; Sr. Vicente Reyes, a civil engineer and architect, at the city of Cuernavaca, 1873, 1874, and 1876; Sr. Joaquín de Mendíazabel Tamborrel, an engineer, at the city of Puebla, 1872 to 1873; Sr. Augustin Galindo at the same city, 1875; Professor Manuel M. Cházaro at San Juan Michapa (State of Veracruz), 1872 to 1873; Priest Pedro Spina, S. J., at the city of Puebla, 1876, and perhaps many others from whom we have no notice, have devoted themselves to making meteorological observations.

The "Sociedad de Geografía y Estadística" the most ancient scientific society in Mexico, distributed, in 1862, some instruments and instructions to observers.

Finally, on the 6th of March, 1877, being President of the Republic, General

CLIMATOLOGICAL DATA OF THE CITY OF MEXICO.
ANNUAL SUMMARIES AND GENERAL SYNOPSIS, 1877-1895.

(ENGLISH MEASURES.)

Lat. N. 19° 26'.

Long. W., Greenwich 6 h. 36 m. 31 s. 56 or 99° 87' 53".

Height, 7472 (Eng. feet).

METEOROLOGICAL DATUM.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	Average, 1877- 1895.
Mean barometrical height reduced to the freezing point.....	23.10	23.09	23.11	23.10	23.10	23.11	23.09	23.06	23.07	23.07	23.07	23.07	23.08	23.08	23.07	23.07	23.07	23.08	23.08	23.08
Maximum barometrical height.....	23.31	23.28	23.40	23.32	23.34	23.38	23.32	23.28	23.25	23.20	23.20	23.20	23.28	23.28	23.27	23.28	23.20	23.30	23.31	23.40
Minimum barometrical height.....	22.80	22.87	22.80	22.80	22.84	22.80	22.84	22.88	22.88	22.85	22.85	22.87	22.87	22.80	22.84	22.80	22.87	22.86	22.87	22.83
Mean barometrical height.....	61.9	61.2	59.5	59.5	59.9	59.7	59.4	59.4	59.7	59.7	59.0	59.5	59.5	59.0	59.2	59.0	59.5	59.0	60.2	59.7
Mean temperature in shade.....	85.1	88.9	84.2	86.....	85.5	86.9	86.0	85.3	86.1	86.1	86.2	84.4	85.4	85.4	85.5	86.9	86.4	86.6	86.8	86.9
Maximum temperature in open air.....	100.5	120.5	106.5	112.8	100.6	100.6	100.0	103.1	96.9	93.0	97.7	100.9	99.0	92.0	86.4	93.9	91.0	95.9	98.6	102.5
Minimum temperature in open air.....	35.2	36.2	30.9	33.1	20.8	28.9	32.5	33.1	38.5	33.8	32.0	36.4	30.5	33.8	36.5	31.6	31.8	34.3	32.9	28.9
Minimum temperature in shade.....	28.2	19.0	21.9	26.4	27.0	27.5	26.0	27.9	28.5	30.0	30.8	31.5	30.0	31.8	28.9	25.2	25.5	22.0	22.0	19.0
Mean temperature of water in shade.....	.....	.....	.....	.....	.....	.....	55.8	55.6	56.8	56.7	56.3	56.8	57.2	55.9	56.7	58.5	56.5	56.5	57.6	56.7
Mean humidity of the air, per cent., in shade.....	59	57	58	59	61	60	62	59	62	60	63	64	60	61	61	58	59	58	57	60
Mean humidity of the air, per cent., in open air.....	.....	.....	.....	.....	.....	61	67	62	63	62	65	64	58	62	62	58	59	58	58	61
Mean vapor tension in shade.....	0.327	0.320	0.306	0.322	0.355	0.319	0.337	0.311	0.359	0.323	0.335	0.347	0.320	0.315	0.320	0.315	0.315	0.315	0.315	0.320
Mean vapor tension in open air.....	0.083	0.099	0.118	0.103	0.091	0.095	0.087	0.103	0.095	0.103	0.091	0.091	0.111	0.095	0.103	0.107	0.095	0.099	0.083	0.099
Mean evaporation of water in shade.....	0.268	0.284	0.319	0.323	0.271	0.232	0.209	0.256	0.240	0.244	0.229	0.244	0.280	0.252	0.240	0.270	0.262	0.217	0.200	0.260
Days of rain, total amount.....	104	120	125	125	162	135	137	123	108	112	166	161	143	155	138	134	136	112	145	138
Rainfall, total amount.....	15.06	35.143	18.767	21.740	23.433	23.624	23.995	16.083	36.602	20.913	31.094	29.130	19.610	25.122	25.917	17.488	22.386	13.007	22.012	22.915
Greatest precipitation in 24 hours.....	1.032	2.442	1.888	1.517	1.457	1.575	1.221	1.071	1.686	1.131	2.064	2.501	1.138	1.595	1.013	1.158	1.639	1.260	2.501	2.011
Average cloudiness.....	4.6	4.4	4.8	4.9	5.3	4.8	5.5	4.7	5.7	5.7	4.9	5.3	5.6	4.9	4.7	4.4	4.6	4.7	5.0	4.9
Prevailing direction of clouds.....	S. W.	S. W.	W.	W.	S. W.	S. W.	S. W.	S. W.	W.	S. W.	S. W.	S. W.	S. W.	N. E.	S. W.	N. E.	N. E.	N. E.	S. W.	S. W.
Amount of cloudy days.....	69	108	121	123	116	118	145	107	146	114	142	158	141	112	105	87	109	103	121	118
Amount of clear days.....	88	142	135	120	99	119	83	113	75	121	110	81	99	108	137	136	135	119	107	114
Prevailing wind.....	N. W.	N. W.	N. E.	N. E.	N. W.	N. E.	N. W.	N. E.	N. W.	N. E.	N. E.	N. W.	N. W.	N. W.	N. W.	N. W.	N. W.	N. W.	N. W.	N. W.
Mean velocity of wind, per hour (miles).....	2.68	2.45	2.23	2.01	2.23	1.56	2.01	1.70	1.79	1.70	0.89	0.89	0.89	1.34	2.23	2.68	2.23	2.68	2.01	2.01
Maximum velocity of wind, per hour (miles).....	28.16	40.23	35.76	40.23	32.41	28.01	31.20	27.94	30.96	46.93	40.23	35.76	34.64	33.08	34.64	45.15	35.55	34.41	32.41	46.93
Direction of the wind of maximum velocity.....	N. W.	N. E.	N. W.	N. E.	N. E.	N. E.	N. E.	N. E.	N. E.	N. E.	S. E.	N. E.	N. E.	N. E.	N. W.	N. E.	N. W.	N. E.	N. E.	N. E.
Ozone (mean) (0-10).....	4.9	3.4	3.8	4.3	4.6	4.7	4.6	4.5	5.0	4.8	4.6	4.2	3.2	1.5	4.5	3.7	3.5	4.2	3.5	46.0
Amount of lightning days.....	77	118	111	146	160	164	149	161	169	101	138	146	133	150	109	110	142	157	155	138

MARIANO BÁCENA, Director.

JOSÉ ZENDEJAS, Vice-Director.

GENERAL SUMMARY OF THE METEOROLOGICAL OBSERVATIONS TAKEN IN THE CENTRAL OBSERVATORY
OF THE CITY OF MEXICO DURING THE YEAR 1896.

Lat. 19° 26'. Long. W. of Greenwich, 6 h. 36 m. 31 s. 56 or 99° 07' 53" 4. Height of the barometer above sea level, 7472.25 (Eng. feet).

	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	YEAR. 1896.
Mean barometrical height, reduced to freezing (inches).....	23.083	23.099	23.051	23.075	23.071	23.079	23.106	23.122	23.071	23.071	23.091	23.071	23.079
Maximum barometrical height (inches).....	23.276	23.181	23.193	23.209	23.177	23.248	23.240	23.240	23.150	23.173	23.240	23.307	23.307
Minimum barometrical height (inches).....	22.878	22.878	22.850	22.906	22.941	22.908	22.905	22.908	22.637	22.957	22.957	22.953	22.854
Mean temperature in shade (Fahrenheit).....	55.04	55.04	61.52	65.48	67.64	65.48	63.50	62.96	62.42	61.34	58.46	51.08	60.08
Maximum temperature in shade (Fahrenheit).....	75.90	75.90	83.48	86.90	86.24	83.48	81.50	78.44	77.36	75.38	71.06	71.60	80.24
Minimum temperature in shade (Fahrenheit).....	36.50	37.40	40.10	43.70	50.00	48.80	45.80	50.00	50.00	49.10	47.30	34.70	34.70
Mean temperature in open air (Fahrenheit).....	55.94	56.84	62.42	65.84	67.88	66.08	63.86	63.14	62.78	61.88	59.00	54.70	61.52
Maximum temperature in open air (Fahrenheit).....	81.14	87.80	94.10	97.16	98.06	95.00	94.10	91.40	89.06	86.90	84.80	78.80	98.06
Minimum temperature in open air (Fahrenheit).....	30.20	30.84	31.28	36.68	42.80	36.50	45.68	44.06	43.98	41.72	38.30	30.60	37.80
Maximum daily range in open air.....	50.70	53.28	57.80	59.04	55.04	58.50	48.30	46.62	45.98	44.84	44.50	46.44	54.36
Mean temperature of soil (33.5 inches deep).....	56.30	55.94	56.66	57.56	61.16	62.78	62.56	62.24	62.24	62.24	61.34	58.64	59.00
Mean temperature of water in shade.....	59.16	52.58	57.38	60.80	62.60	60.98	60.86	59.54	59.00	57.92	55.04	52.70	57.56
Mean humidity of the air, per cent., in shade.....	54	46	41	46	47	54	65	65	69	71	68	61	57
Mean humidity of the air, per cent., in open air.....	54	46	41	46	47	54	65	65	69	71	70	64	58
Mean vapor tension in shade (inches).....	0.244	0.221	0.236	0.284	0.311	0.343	0.369	0.388	0.410	0.406	0.354	0.252	0.319
Mean vapor tension in open air (inches).....	0.244	0.207	0.220	0.288	0.311	0.347	0.369	0.386	0.410	0.406	0.364	0.271	0.319
Mean evaporation of water in shade (inches).....	0.083	0.048	0.107	0.111	0.142	0.130	0.095	0.079	0.079	0.071	0.071	0.055	0.091
Mean evaporation of water in open air (inches).....	0.190	0.107	0.264	0.311	0.358	0.331	0.216	0.220	0.232	0.217	0.168	0.118	0.236
Days of rain, total amount.....	1	6	6	7	7	13	22	25	22	17	13	4	143
Rainfall, total amount (inches).....	0.016	0.039	0.039	0.021	0.073	1.170	3.019	2.555	3.324	4.135	0.705	0.615	17.800
Greatest fall in 24 hours (inches).....	0.016	0.035	0.024	0.026	0.107	0.433	0.767	0.634	0.014	1.181	0.300	0.528	1.181
Mean amount of clouds (5-10).....	4.1	2.8	2.3	4.1	4.5	5.5	7.1	6.3	7.2	6.4	5.9	5.4	5.1
Prevailing direction of clouds.....	S. W.	S. W.	S. W.	S. W.	N. E. & N. W.	N. E.	N. E.	N. E.	N. E.	N. E.	N. E.	S. W.	N. E.
Amount of cloudy days.....	6	3	21	8	6	8	16	13	20	15	9	13	111
Amount of clear days.....	12	10	21	8	9	3	1	1	0	5	2	5	84
Prevailing wind.....	N. W.	N. W.	N. E.	N. E.	N. E.	N. E.	N. E.	N. W.	N. E.	N. W.	N. W.	N. W.	N. E. & N. W.
Mean velocity of wind per hour (miles).....	1.79	2.68	2.68	2.90	3.35	4.69	3.79	3.35	2.68	1.79	2.12	0.67	2.68
Maximum velocity of wind per hour (miles).....	30.90	25.51	29.05	28.25	27.94	27.27	33.32	26.37	30.17	20.33	16.76	11.76	33.52
Direction of the wind of maximum velocity.....	S. S. E.	S. S. E.	N. E.	N. E.	N. W.	N. E.	N. E.	N. E.	N. E.	N. E.	N. E.	N. E.	N. E.
Ozone [mean] (5-10).....	3.4	3.5	3.7	3.8	3.7	3.7	3.5	3.7	3.5	3.3	3.2	2.7	3.5
Amount of lightning days.....	0	1	4	13	17	19	26	26	24	21	10	0	101

MARIANO BÁCENA, Director.

JOSÉ ZENDEJAS, Vice-Director.

the digestive and respiratory organs, the former amounting to 4472 or 1.35 per cent. of the population and the latter to 3904 or 1.18 per cent. of the population, and both causing 8376 deaths or 53.81 per cent. of the total number of deaths. Deaths by typhus and typhoid fevers and small-pox, which are supposed to make such great ravages in the City of Mexico, were in reality insignificant, the deaths by the former amounting in that year to 480 or 0.14 per cent. of the population, and the deaths by small-pox were, in the Federal District, embracing the City of Mexico and twenty-three suburban towns, 217 or 0.047 per cent. of the population of the District which is 473,820. Small-pox only attacks the very poor people, and, strange to say, also foreigners, even in case they have been vaccinated in their country, and to be free from small-pox they must be vaccinated in Mexico.

The months of the greatest mortality during the same year were from February to May, and of the smallest the month of August, showing that the unhealthy months are the dry months, that is before the rains set in.

The mortality in the City of Mexico is indeed very large, and it is due principally to two causes, first, the want of proper drainage and sewerage for the refuse of the city, a trouble which is now almost com-

Porfirio Díaz, and by the suggestion of General Vicente Riva Palacio, then Secretary of Public Works, the Central Meteorological Observatory was established. From that date up to the present, an uninterrupted hourly observation is regularly taken during the day and the night in the Central Meteorological Observatory. Some magnetical observations have also been made, and the Observatory is now thought of being removed to a more suitable spot.

After the establishment of the Central Meteorological Observatory, some official or private meteorological stations have also been established as follows: Aguascalientes (Instituto del Estado); Guadalajara (Escuela de Ingenieros), observer, Agustín V. Pascal; Guanajuato (Colegio del Estado), observer, Genaro Montes de Oca; León (Escuela Secundaria), observer, Mariano Leal; Mazatlán (Observatorio Astronómico y Meteorológico), observer, N. González; Oaxaca (Colegio del Estado), observer, Dr. A. Domínguez; Pachuca (Instituto del Estado), observer, Dr. N. Andrade; Puebla (Colegio Católico and Colegio del Estado), observers, Priest P. Spina and B. G. González respectively; Querétaro (Colegio Civil), observer, J. B. Alcocer; San Luis Potosí (Instituto del Estado), observer, Dr. G. Barroeta; Toluca (Instituto del Estado), observer, S. Enríquez; Veracruz, observer, G. Baturoni; Zacatecas (Instituto), J. A. Bonilla. Dr. Manuel Andrade, of Huejutla; Dr. Matienzo, of Tampico; Father Pérez, of Morelia; Father Arreola, of Colima; Father Castellanos, of Zapotlán; Sr. Pascual Borbón, of Tacámbaro, are enlightened observers to whom the Central Meteorological Observatory is indebted for their valuable co-operation, and also to the telegraph operators of the "Telegraph system," who send, daily, some weather observations to this office.

The staff of the Central Meteorological Observatory is now as follows: Director, Mariano Bárcena; Vice-Director, José Zendejas, C.E.; Second Observer, Francisco Toro; Assistants, Rafael Aguilar, Francisco Quiroga, Angel Robelo, José Torres, and J. I. Vázquez.

pletely remedied, and the second, the unhygienic way of living of the poor classes, among whom takes place the largest mortality.

The very large number of still-births which occurred in the City of Mexico in 1896, almost exclusively among the poor classes, shows the little care that the poor women take of themselves, and is enough to explain the present large mortality.

RAILWAYS.

For many years the government earnestly endeavored to further the construction of railroads in Mexico, but the broken surface of the country made the building of these roads very expensive. Until 1873 the means of internal locomotion were mainly limited to a few wagon roads, over which travelled twenty-four regular lines of diligences, under one management; and bridle-paths from the central plateau over the sierras and terrace lands down to a few points on both coasts.

In 1854 the first railroad was finished, connecting the City of Mexico with Guadalupe, about three miles in length, and another from Veracruz to Tejeria towards the City of Mexico about twelve miles in length; these being the only railroads that were built, up to 1861. During the French Intervention the French army extended the Tejeria road to Paso del Macho, about thirty-five miles further, to the foot of the mountain, so as to be able to transport their army, with the shortest delay possible, out of the yellow-fever zone, toward the central plateau; and an English Company, which had a grant for a road from the City of Mexico to Veracruz, which was supposed at the time to be the only one that could be built in Mexico, extended the Guadalupe road to Apizaco in the direction of Veracruz and not far from Puebla.

No construction of consequence was done immediately after the French Intervention, because the country was generally in a disturbed condition, although several efforts were made in that direction by President Juarez, under whose administration a new and very liberal grant was given to the Veracruz railway company. The Veracruz road was finished in 1873, during Señor Lerdo de Tejada's Presidency, and when General Diaz became President in 1876 he earnestly promoted railroad building; and we now have two trunk lines connecting the City of Mexico with the United States—the Mexican Central to El Paso, Texas, with a branch from San Luis Potosi to the port of Tampico, and another from Irapuato to Guadalajara, which has recently been extended to Ameca, towards the Pacific; and the Mexican National to Laredo, Texas, with several branches. Another trunk line from Eagle Pass to Torreon and Durango, which it is intended shall finally reach the Pacific, has also been built by Mr. C. P. Huntington and his associates. There is besides a line from Nogales to Guaymas, built and owned by the Atchison, Topeka, and Santa Fé

Company ; and these four lines connect us with the main systems of the United States, our lines being in fact extensions of the United States railway system.

We have now two lines from the City of Mexico to Veracruz, the old Veracruz road passing by Orizaba, and the Interoceanic, which runs from Veracruz by Jalapa and the City of Mexico and is intended to reach the Pacific. All of our roads, excepting the one built by Mr. Huntington, have had large subsidies paid by the Mexican Government, and in one case, that of the Veracruz railroad, the subsidy paid was \$560,000 per year, for twenty-eight years, or about \$57,471 per English mile, although the average subsidy per mile, according to President Diaz's report, dated November 30, 1896, is \$14,380.

The Tehuantepec railway, running from Coatzacoalcos on the Gulf of Mexico to Salina Cruz on the Pacific, about one hundred and thirty miles in length, has been built at great expense and at a great sacrifice by the Mexican Government. I published in the *Engineering Magazine* for March, 1894,¹ an article stating the different efforts made by the Mexican Government to have that road built, and the advantages that we expected from it as a highway of trade between the Atlantic and the Pacific. The Mexican Government has recently made a contract with Messrs. E. Weetman, Pearson & Son, of London, for the building of good harbors at both ends of the road, and when that is accomplished we expect that a great deal of eastern trade will pass through Tehuantepec.

With the exception of the Tehuantepec road, we have not yet any road running from the Atlantic to the Pacific, although several are in process of construction. The descent of the mountains is on the Pacific slope a great deal more difficult than on the Gulf coast, where the large centres of population are located near the Gulf, and this explains why none of the roads have so far been able to reach the Pacific Ocean.

Our railway system extends now, in the direction of Guatemala, as far as the city of Oaxaca, where we are only about five hundred miles away from our frontier with Guatemala. In other directions, our system reaches the principal cities and commercial and mining centres of the country.

The total mileage of railway in 1895 was 6989½ English miles. President Diaz, in his above mentioned report gives, the total mileage of railways in Mexico as 11,469 kilometres or 7126 miles ; and in his message to Congress on April 1, 1897, he stated that the railway mileage had been increased by 238 kilometres 550 metres, finished and received by the Government, and 248 kilometres built, but not yet received officially, making a total mileage of 11,955 kilometres 550 metres, or 7,429 miles.

¹ This paper will appear in this volume.

President Diaz's Railway Policy.—President Diaz deserves a great deal of credit for his efforts to promote in Mexico, material improvements, and especially in railroad building. When he came into power, in 1877, public opinion was very much divided as to the policy of allowing citizens of the United States to develop the resources of the country by building railroads, working mines, etc. Our experience of what took place in consequence of the liberal grants given by Mexico to Texan colonists made many fear that a repetition of that liberal policy might endanger the future of the country by giving a foothold in it to citizens of the United States who might afterward, if circumstances favored them, attempt to repeat the case of Texas. President Lerdo de Tejada seemed to share such fears judging by his policy in this regard. But President Diaz, as a broad-minded and patriotic statesman, believed that the best interest of the country required its material development, and that it would not be advisable to discriminate against citizens of the United States, as that country was more interested than any other, on account of its contiguity to Mexico, in developing the resources of our country by building an extensive system of railways, and would, therefore, be more ready than any other to assist in building them. He trusted, at the same time, that when the resources of the country should be more fully developed, it would become so strong as to be beyond reach of the temptation by foreign states or individuals. The results of the work done in Mexico so far show that General Diaz acted wisely, and proved himself equal to the task before him.

Many in Mexico, and myself among the number, thought that, as the railroads were such lucrative enterprises, especially in a country endowed with so many natural elements of wealth as Mexico, it would not be judicious to give their promoters any pecuniary assistance, in the shape of subsidies or otherwise, the more so as the finances of the country were then in a critical condition, and it would not be wise to increase its burdens by large pecuniary subsidies in aid of private enterprises. My opinion in this case was based mainly on what I had seen in the United States, namely : that long lines of railways are built in this country without any pecuniary assistance from the Government, and that when the Government subsidized any one line it became a source of great dissatisfaction and very unpleasant questions, which are yet unsettled. We feared also that such large subsidies as were asked by the railway promoters would amount in the end to so large a sum as to make it impossible for Mexico to pay it, discrediting the country. But in this case General Diaz's view seems to have been the right one, in so far as that it afforded a great inducement for the immediate building of large trunk lines of railways, which, without subsidy, might have been delayed for several years. He thought it

worth while to spend large sums of money for the purpose of having railways built without delay, rather than trust to the fluctuations of confidence and credit in the foreign exchanges, that would enable the prospective companies to obtain the funds necessary to build their roads, trusting, at the same time, that the material development of the country promoted by the railroads would yield revenue enough to pay all the subsidies granted. Fortunately all railroad subsidies contracted by Mexico have been punctually paid, and their amount forms now a large item of our national debt. To pay some of them the mistake was made of negotiating a sterling loan on Europe, to pay a silver debt; but even in that way the transaction is not altogether a bad one.

General Diaz's policy was to give a railway subsidy to anybody asking for it without investigating the responsibility of the concern, with the idea that if the road was built the country would get the benefit of the same, and if it was not built nothing would be lost, as there was in all grants, a clause to the effect that if no building was done within a given time, the grant should by that mere fact be forfeited, the forfeiture to be declared by the Administration.

The system of subsidizing railways has a great many drawbacks, but at the same time commands some decided advantages, like giving the government the strict supervision over the roads who have to submit to it for its approval, tariffs for freights and passengers, the free carrying of the mails, the duty of the company to present to the government a yearly statement of its traffic, receipts, etc., and other similar advantages. In all grants to subsidized railroads there is a stipulation that at the end of ninety-nine years the road-bed would revert to the Mexican government.

President Diaz's Statistics on Mexican Railways.—Before I close this chapter I think it will not be out of place to quote some remarks of President Diaz concerning our Mexican railroads, which occur in his above-mentioned report.

.

"In 1875 we had 578 kilometres 285 metres of railway, in 1885 we had 5915 kilometres, in 1886, 6018 kilometres, in November, 1888, 7940 kilometres, in June, 1892, 10,233, and including the tramways and other local and private lines, the amount was 11,067 kilometres; in September, 1894, we had 11,100 kilometres; in April, 1896, 11,165 kilometres, and now we have 11,469 kilometres. . . .

"We stand first in railroad building of all the Latin-American countries. During the years 1877 to 1892 Mexico built more railroads than any other Latin-American State, being 11,165 kilometres; the Argentine Republic takes the second place, with 8108 kilometres, and Brazil the third, with 6193 kilometres, built during the years mentioned. The average number of kilometres built per annum in Mexico during this period was 689, the maximum having been reached in

1881-82.....	1938 kilometres
1882-83.....	1727 "
1887-88.....	1217 "
1889	1263 "

The number of passengers carried in

1876.....	4,281,327
1890.....	19,531,395
1893.....	22,781,343
1895.....	24,269,895

The freight handled in

1876.....	132,915 tons
1890.....	2,734,430 "
1893.....	3,798,360 "
1895.....	4,117,511 "

The gross receipts in

1876.....	\$2,564,870
1890.....	21,019,960
1893.....	26,121,624
1897.....	28,758,450

" The subsidies paid for railroads up to December, 1892, averaged \$8935 per kilometre of road built and in operation at that date. This average is much less than that of the subsidies paid by other Latin-American countries, the Republic of Chili having averaged \$17,635 per kilometre, and the Argentine Republic \$31,396.

" The railroad system of the Republic has given the capital direct and rapid connection with our principal states. Throughout the length of the central plateau to the frontier, Mexico City is connected with the capitals of the states of Querétaro, Guanajuato, Jalisco, Aguascalientes, Zacatecas, Chihuahua, and San Luis Potosi by the Mexican Central Railway, and with Durango by the Mexican International; with the states of Mexico, Guanajuato, Michoacan, San Luis Potosi, Coahuila and Nuevo Leon by the Mexican National; with the cities of Puebla, Orizaba, Cordoba, Veracruz, and Jalapa by the Mexican Railway and by the Interoceanic, and with Tehuacan and Oaxaca by the Mexican Southern from Puebla. Three lines connect the capital with the northern frontier; the Central, which terminates in Ciudad Juarez; the National, which runs to Nuevo Laredo; and the International, which, from its junction with the Central at Torreon, runs to Piedras Negras. And as to our various ports Guaymas is connected with Nogale on the northern frontier; Manzanillo with Colima; Matamoros with Reynosa and San Miguel; Tampico with San Luis Potosi and Monterrey; Veracruz with Jalapa and Mexico; and the first really Interoceanic railway of the Republic across the Isthmus of the Tehuantepec, united the Atlantic and Pacific oceans by connecting the port of Coatzacoalcas, on the gulf, with the port of Salina Cruz on the Pacific coast. Southward from the capital of the Republic the Interoceanic traverses the State of Morelos, and the Mexico, Cuernavaca and Pacific Railway has its line located to the City of Cuernavaca and is pushing on through the state of Guerrero to the port of Acapulco. In the peninsula of Yucatan, the lines connecting Campeche and Merida are nearly finished; while the port of Progreso has rail communication with Merida."

Financial Condition of Mexican Railways.—Our railroads are doing remarkably well, and their traffic, especially domestic, is daily increas-

ing and grows in much larger proportion than the foreign, or international traffic ; and they are paying the interest on their debt, which is due and paid in gold, notwithstanding that they collect their freights in silver, which has been for several years at a great discount, losing at the present rate of exchange about one hundred per cent. in the operation ; but their business is such that they can afford to suffer that loss.

In the statistical section of this paper will be found a list of our railroads, their mileage, earnings, and several other data, showing that they are in a prosperous condition, all of which will be of interest to those who desire to have a more intimate acquaintance with the railway system of Mexico. I will only insert here the following statement of the annual building and earnings of the Mexican railways, supplementing it with a comparative statement showing the tonnage moved by the principal railway lines, for the ten years ending December 31, 1896, which shows a great increase in their business, and consequently in their earnings.

ANNUAL BUILDINGS AND EARNINGS OF MEXICAN RAILWAYS.

YEAR.	MILES OF ROADS BUILT.		ANNUAL EARNINGS.
	Each year.	Total.	
1873.....	— —	359,306	\$2,097,104.55
1874.....	5,393	364,699	2,665,496.18
1875.....	47,087	418,001	2,799,696.13
1876.....	2,265	414,052	2,563,241.00
1877.....	3,739	417,791	3,213,434.17
1878.....	40,748	458,539	3,400,799.89
1879.....	91,950	550,488	3,828,718.65
1880.....	120,328	670,817	4,504,135.39
1881.....	429,858	1,100,675	5,679,193.37
1882.....	1,204,118	2,304,792	9,883,719.51
1883.....	1,073,404	3,378,196	12,102,583.34
1884.....	282,523	3,660,719	11,089,136.39
1885.....	73,614	3,734,332	10,656,551.42
1886.....	49,099	3,783,432	11,373,667.63
1887.....	323,084	4,106,516	13,310,218.79
1888.....	756,522	4,863,060	16,121,267.79
1889.....	390,650	5,253,096	18,788,142.29
1890.....	784,744	6,037,752	20,919,287.14
1891.....	495,015	6,532,711	23,762,172.87
1892.....	352,171	6,884,842	25,363,922.29
1893.....	14,829	6,870,015	25,359,244.06
1894.....	118,810	6,888,811	—

Telegraphs.

121

COMPARATIVE STATEMENT, SHOWING APPROXIMATE TONNAGE MOVED
BY THE UNDERMENTIONED RAILWAYS FOR THE TEN YEARS
ENDED DECEMBER 31, 1896.

(Compiled from published reports and information furnished by the respective railway companies.)

YEAR.	CENTRAL RAILWAY.	NATIONAL RAILWAY.	INTEROCEANIC RAILWAY.	MEXICAN RAILWAY.	TOTAL.
	Tons.	Tons.	Tons.	Tons.	Tons.
1887.....	346,898	77,935	141,090	273,194	839,117
1888.....	477,530 Inc. 34.4	372,800 Inc. 378.3	197,231 Inc. 39.7	318,893 Inc. 16.7	1,366,454 Inc. 62.7
1889.....	540,479 Inc. 13.1	428,314 Inc. 14.8	186,222 Dec. 5.5	354,321 Inc. 11.1	1,509,336 Inc. 10.4
1890.....	609,382 Inc. 12.7	472,045 Inc. 10.2	281,769 Inc. 51.3	384,584 Inc. 8.2	1,747,780 Inc. 15.7
1891.....	867,657 Inc. 42.3	502,856 Inc. 7.3	277,866 Dec. 1.3	409,185 Inc. .6	2,057,564 Inc. 17.7
1892.....	1,091,785 Inc. 25.8	588,505 Inc. 17.	365,191 Inc. 31.4	367,980 Dec. 10.	2,413,461 Inc. 17.3
1893.....	860,187 Dec. 21.2	552,123 Dec. 6.5	380,805 Inc. 4.3	385,923 Inc. 4.8	2,179,038 Dec. 9.7
1894.....	898,484 Inc. 4.4	558,382 Inc. 1.1	444,191 Inc. 16.6	433,637 Inc. 12.3	2,334,694 Inc. 7.1
1895.....	1,047,038 Inc. 16.5	636,193 Inc. 13.9	464,976 Inc. 4.4	453,289 Inc. 4.5	2,601,496 Inc. 11.4
1896.....	1,231,025 Inc. 17.5	782,106 Inc. 22.9	479,744 Inc. 3.1	756,330 Inc. 66.8	3,249,205 Inc. 24.8
	7,970,465	4,971,259	3,219,085	4,137,336	20,298,145

(S.) A. BLAKE.

CITY OF MEXICO, May 19, 1897.

TELEGRAPHS.

We have quite a number of miles of telegraph lines in Mexico, and our service is now as good as that of any other country. The first telegraph line built and owned in Mexico by a private company, liberally assisted by the government, extended from Veracruz to the City of Mexico. On November 5, 1851, the first section was inaugurated from the City of Mexico to Nopalucan, and on May 19, 1852, to Veracruz.

In 1853 another company established a line from the City of Mexico towards the north to Leon in the State of Guanajuato, and in 1865 a line was finished to San Luis Potosi.

In 1868 and 1869 a private company, called the "Jalisco Company" established the line between the City of Mexico and Guadalajara, which was soon afterwards extended to Manzanillo and San Blas. After the restoration of the Republic in 1867, the Mexican government began to

build lines to the principal centres of population of the country, and in 1890 it bought the Jalisco line, and in 1894 the Veracruz.

From 1869 to 1876 the States of Michoacan, Oaxaca, and Zacatecas established several lines in their respective jurisdictions. When General Diaz became President in 1876, the National Telegraphic Lines only had 7927 kilometres.

In 1885 the Federal Government transferred to the States, without any cost, all the telegraphic lines which were considered of local interest, keeping only such as could be called trunk lines.

In 1893 we had 37,880 English miles of telegraph lines, of which 24,840 belonged to the Federal Government, the remainder belonging in about equal parts to the States, private companies and railways.

The following statement, which I take from the *Anuario Estadístico de la Republica Mexicana, 1895*, shows the telegraphic lines belonging to the Federal Government, to the States, to private companies and to railroads :

Federal Lines.....	43,416 k	780 m
State Lines.....	5,544	068 "
Private Company Lines.....	4,730	980 "
Railroad Lines.....	9,761	611 "
General Total.....	63,453 k	439 "

On November 30, 1896, the total mileage of our telegraph lines was, according to the President's report of that date, 45,000 kilometres, 27,962 English miles, and that amount was increased, according to the President's message of April 1, 1897, to 45,259 kilometres, 28,123 miles.

In 1891 the operations of the various lines throughout the Republic involved the transmission of 1,050,000 messages, of which about 800,000 were private, and the remainder official. The receipts from this branch of the public service amounted to \$469,305 collected at 767 offices ; the expenditure included for repairs an average of \$3 per kilometre, and for salaries a total of \$671,431.

The proceeds of the Federal telegraphic lines were, according to President Diaz's report of November 30, 1896, as follows :

Fiscal Year, 1883-1884.....	\$239,051
" " 1890-1891.....	462,076
" " 1893-1894.....	524,634
" " 1895-1896.....	537,308

In the statistical portion of this paper will be found a detail statement of the earnings and expenses of the national telegraphic lines of

Mexico for the 27 fiscal years which elapsed from July 1, 1869, to June 30, 1896, and such data as it is possible to obtain for the ten years which elapsed from July 1, 1869, to June 30, 1879.

Cables.—Up to 1887 there was no communication between Mexico and foreign countries. In 1880 the Mexican Cable Co. built their cables from Galveston to Tampico, Veracruz and Coatzacoalcas, on the Gulf of Mexico, and a telegraphic line from Coatzacoalcas to Salina Cruz, on the Pacific, which was extended to Central and South America. Cables had been laid between Jicalango and El Carmen and between the rivers Grijalva and Coatzacoalcas, and now through those cables we are in direct communication with the United States and Europe.

POSTAL SERVICE.

Our postal service has improved considerably of late. It was until recently quite imperfect on account of the difficult and expensive ways of communication. It used to be slow and so expensive that it was almost prohibitory, and up to 1870 the single postage of a letter, weighing one quarter an ounce was 25 cents, and double for any distance exceeding sixty miles. After Mexico entered into the Universal Postal Union, in 1870, the postage of letters for foreign countries was reduced to 5 cents, and that reduction made it necessary to reduce the home postage from 25 to 10 cents. Recently it has been reduced again from 10 to 5 cents.

There were in the whole country, in 1883, one head post-office at the national capital, 53 first-class post-offices, 265 second class, for the most part inefficient, and 518 postal agencies, little better than useless. The entire service as it was being rendered at 837 stations. The evils resulting from the very high postage were further aggravated by the insecurity of the mails. The revenue of the postal department in that year amounted to \$817,244.

The total number of post-offices and postal agencies in 1893 was 1448, and the mail pouches are now transported on railways over a total distance of 10,000 kilometres, or more than 6000 miles. Over the remaining distances in the interior the mails are conveyed either by stages or by foot or mounted carriers.

President Diaz gives in his report of November 30, 1896, the following statistics about our postal services :

	Post Offices.	Postal Agencies.
1877.....	53.....	269
1888.....	356.....	719
1892	356	1430
1895	469	1471
1896	471	1500

President Diaz states in his same report that the total number of pieces distributed by our mails in the year 1878 was 5,169,892, while in the year 1896 the number increased to 24,000,000.

For the purpose of communicating with foreign countries, especially before railroads were finished, the Mexican government granted large subsidies to steamship companies, running especially between Mexican and United States ports, and their amount increased considerably the expenses of our post-office department.

In the statistical part of this paper I shall insert the statement of the earnings and expenses of the postal service in Mexico, in the twenty-seven years elapsed from July 1, 1869, to June 30, 1896.

PUBLIC LANDS.

The Spanish government considered itself the owner of lands in Mexico, and it granted them to private parties under certain very liberal regulations. The Indians having been the original owners, and needing the lands to raise their food, and textiles for their clothing, could not be entirely deprived of them, and a large portion of the land was left to each municipality to be held generally in common by the inhabitants of the same. Large tracts of land remain, however, which had not been granted either to the Indians nor to the Spanish settlers, and these we called vacant lands—*Terrenos Baldios*. The Mexican government succeeded Spain in the ownership of public lands, and with a view to make them available for colonization an easy system to dispose of them at a comparatively low price was established.

The greatest difficulty was to find the public lands, as they had never before been surveyed, and a great many were occupied without title by private parties. As such survey would be very expensive, the Mexican government devised a plan of contracting that work with private companies, paying them with one-third of the land measured, and in that way large portions of the public lands have been surveyed.

It appears from President Diaz's report to his fellow-citizens, dated November 30, 1896, that up to 1888 private companies had surveyed 33,811,524 hectares of public lands, for which they received in payment for their work one-third or 11,036,407 hectares. In the four years from 1889 to 1892, 16,820,141 hectares of public lands were surveyed by private companies, of which 11,213,427 hectares belonged to the government, and in that way in less than ten years it was possible to survey 50,631,665 hectares. Out of this amount the government sold to private parties and to colonization companies 1,607,493 hectares, and to private companies who were in possession of public lands held by them without any title, which we call *demacias*, 4,222,991 hectares. At the same time the government has been trying to divide the lands held in common by the Indian towns between the inhabitants of the

same, and up to 1888 it had distributed in that manner 67,368 hectares among 2936 titles, and from 1889 to 1892 180,169 hectares among 4560 titles. In accordance with the provisions of our public land laws we sold to private parties, who pre-empted the lands for purchase, which we call "*denuncio*," 3,635,388 hectares among 1504 titles, and from 1889 to 1892 1,353,137 hectares among 1218 titles. From July 1, 1891, to August 18, 1896, 9,677,689 hectares of land were surveyed, of which 6,504,912 hectares belong to the government, and the balance, 3,172,777 hectares, belong to private companies.

Every year the Department of Fomento publishes under authority of law a price-list of public lands, which have different prices in each state and are sometimes divided into three classes; the first, second, and third having each a different price. The following is the official price of public lands fixed by the Department of Fomento for the fiscal year 1895-1896:

STATES	PRICE PER HECTARE	STATES	PRICE PER HECTARE
Aguascalientes.....	\$2.25	Oaxaca.....	\$1.10
Campeche.....	1.80	Puebla.....	3.35
Coahuila.....	1.00	Queretaro.....	3.35
Colima.....	2.25	San Luis Potosi.....	2.25
Chiapas.....	2.00	Sinaloa.....	1.10
Chihuahua.....	1.00	Sonora.....	1.00
Durango.....	1.00	Tabasco.....	2.50
Guanajuato.....	3.35	Tamaulipas.....	1.00
Guerrero.....	1.10	Tlaxcala.....	2.25
Hidalgo.....	2.25	Veracruz.....	2.75
Jalisco.....	2.25	Yucatan.....	1.80
Mexico.....	3.35	Zacatecas.....	2.25
Michoacan.....	2.25	District federal.....	5.60
Morelos.....	4.50	Territore de Tepic.....	2.00
New Leon.....	1.00	Territory of Lower Cal...	0.65

In the statistical part of this paper I shall insert some data about the sales of public lands by the Mexican government from 1867 to 1895, and a statement of the titles issued from the years 1877 to 1895.

IMMIGRATION.

It has always been the aim of the Mexican government from the time of the independence of the country, to encourage the immigration of foreigners, because Mexico being so large and the population so scanty, it was considered a necessity to promote the development of the country, to increase the population by inducing the settlement of foreigners, and different laws have been issued for that purpose.

Since the restoration of the Republic new laws have been sanctioned to encourage colonization, which allow colonists and the companies bringing them free importation of their personal goods and such articles

as they may need for their subsistence and welfare for a reasonable term of years, exempting them at the same time from all kinds of taxes—federal, state, and municipal,—excepting only the stamp tax, and also exempting them from military and other personal service, and sometimes even going so far as to give a bounty for each colonist brought to the country. Under such laws several contracts were made with different companies, and 32 colonies have been planted in different sections of Mexico, of which 13 have been established by the government and 19 by private parties. In 1892 there were only 1266 families with a total number of 10,985 colonists. On the whole, the efforts made and the expenses incurred by the Mexican government in the establishment of those settlements of colonists, have had but unsatisfactory results, but they have paved the way for future experiments on a larger scale, especially if undertaken by private parties, and with only such assistance from the government as can be rendered by liberal legislation.

The principle obstacle which has prevented us from having a large immigration is our low wages. Those who immigrate are generally poor wage earners, who want to better their condition, and they could not go to a country where wages are a great deal lower than in the United States, or even in Europe, as they could never compete with the native labor of our Indians. We have now a surplus of labor and a deficit of capital, and cannot have a large immigration until such conditions are changed.

What Mexico needs is capital to develop her resources and give employment to labor, and then immigration will flow in as naturally as water seeks its level. Mexican credit will be established, so far as immigration is concerned, when her natural resources are developed, this being the only safe and reliable basis of such credit, and this will never be developed until those who have capital to invest are acquainted with the unparalleled opportunities for safe and profitable investment in Mexico. This will only be accomplished by plain, blunt, matter-of-fact and well-informed press agents, who lay before people who have money to invest the plain facts of the case.

Immigration from the United States.—I have often been asked for my opinion of the chances of Americans going to settle in Mexico, and have always answered that while Mexico is desirous of attracting good settlers, and while that country undoubtedly offers great inducements to foreign settlers, especially to those having some means, there are serious drawbacks which ought to be pointed out to the prospective immigrant from the United States, as a warning against a possible failure and disappointment.

The comforts of life in the rural districts of Mexico, where a settler from this country has the best chances, are scanty compared with simi-

lar districts in the United States. The difference of race, language, religion, and education between a young man brought up in this country and the small Mexican farmers, are enough to create difficulties at first sight insuperable to any young man from the United States who settles there. If he establishes himself in a district inhabited only by Indians these difficulties are considerably increased. If the settler prefers the hot lands, which are the most fertile and productive, the severity of the climate is such as to challenge the courage of the bravest. The mosquitoes of several varieties, the flies, and many other insects are very annoying, besides the sickness inherent to such climate.

The question of labor is another great difficulty in the way, because, while it is cheap and abundant in the cold regions, it is generally scarce and unreliable in the hot lands.

The conditions of the two countries are so very different that the change experienced by one brought up in this country who goes into Mexico, is very apt to discourage the strongest and most sanguine, at least in the beginning, as the lapse of time makes anybody adapt himself to existing conditions and to appreciate the advantages of his new home.

The land question is also a serious objection. A large portion of the public lands have already been disposed of, and comparatively little of the public and private lands have been surveyed, and cannot easily be had in small lots. The large land-holders are unwilling to divide their estates, and the Indians holding large tracts of land are very reluctant to part with them at any price.

Coffee raising is undoubtedly one of the most profitable undertakings in Mexico, but at the same time it has serious drawbacks. It takes from three to four years before the trees begin to yield, and the planter must be provided with sufficient means to defray not only his personal expenses, but also those of the plantation, like houses, machinery, cultivation, etc., without receiving any proceeds until the third or fourth year. Besides, if he makes any mistake in the selection of his land, his profits will be considerably reduced. The general impression prevailing in Mexico is that coffee is the product of the hot lands, where the coffee trees need shade; but a plantation in such lands would cost a great deal more money to make and to keep, and would yield smaller profits than one located in the temperate zone, that is, just below the frost line.¹

¹ The same views were expressed in Mexico to the State Department by the United States Consuls, and even published in the *Consular Reports* for August, 1894, vol. xlv., No. 167, pp. 628, 629.

"Consular advices received at the Department of State warn Americans about emigrating to Mexico, with a view to permanent settlement, with insufficient means or without informing themselves in a reliable way as to the prospects for earning liveli-

For the American common laborer who looks to his day's pay for his living, Mexico is unquestionably not the proper place to go. He cannot compete with the Mexican laborer, whose usual pay is from 38 to 50 cents a day in silver, and he boards himself. For the man who has no means, unless he is especially qualified in some particular branch, and knows something of the language, and will work harder and longer hours, it is no place. There is room for the steady, sober, industrious mechanic or miner or tradesman who will adapt himself to new conditions and surroundings, leave all social, political, and other ambitions behind him, and who will attend strictly to his own business.

Those who are safest in going to Mexico are those who have a little capital, say from \$2000 in gold and upward, which will give them about twice that amount there; who can look around and decide what they propose to do, and where they want to settle. There is an excellent field for the small general farmer of the New England or Middle States type, who will raise a little of everything. Butter, potatoes, hogs, poultry, corn, vegetables, and small grain find a ready sale at good prices. I have seen the common article of corn, which is nearly always a sure crop, sell at from \$1 to \$1.25 per bushel, Mexican money.

It is always best for the mechanic or miner to first secure a job before going to Mexico, and work for wages several months, and in the meantime study the situation, get acquainted with the language, the customs, and the people before going it alone.

The manner of living there and the customs of the people are totally different from those of the United States. Those going there will have to work harder and longer hours than in the United States, but they can save money. Ten years ago Americans went to Mexico to make money and return to the United States; to-day they go to find homes. I know several Americans who would not live in the United States again.

The climate of Mexico permits a man to work every day in the year. The cost of living and clothing is cheap, and a dollar in Mexican money can be made to go as far there as a dollar in American money in the United States, and a dollar there is easier to get.

In mining, Mexico offers inducements superior to any other countries. While there are undoubtedly good opportunities in Mexico for enterprise, frugality, and thrift, it is like other countries, a land of varying conditions, and it often happens that disappointment is the result of emigration undertaken upon insufficient or misleading information, or without resources, which are always necessary for success in a new country. Many Americans have been induced by alluring statements as to the cheapness of coffee raising, etc., to emigrate to Mexico within the past year, and some have lost their all by so doing. For these reasons Consuls desire to caution Americans against the representations of speculators, who are always on the watch for the unwary."

try ; and whether a man has a thousand dollars or a million he can go there and make money if he exercises ordinary precaution and judgment, and if he makes up his mind to stand the discomforts of the country. It is a good country for the prospector, too, because there are no seasons against him, and there are many new fields entirely untouched; but he needs money enough to get there with and enable him to obtain the proper kind of outfit, and time to familiarize himself with the requirements of the law and select some district in which he wants to operate.

For the small capitalist, or for a small syndicate, there is no finer field for the organizing of small legitimate companies for the purposes of opening and working old abandoned mines, which are filled with débris or water, and which it will pay to clean out and work, and of which there are still many to be had. In times gone by they were abandoned because of the refractory condition of the ores, or lack of machinery, or want of transportation, all of which conditions have been removed. There is also a fine opening for capital for the exploration of the new gold-fields in the vicinity of Guadalupe y Calvo, in the range between Sonora and Chihuahua, in the State of Guerrero, and in many other localities.

There are in various parts of Mexico educated, experienced, and thoroughly reliable Americans to be found, who have lived a long while in the country, and know the language, the laws, and the people, and would be willing to give reliable information to young Americans wishing to go there.

PUBLIC DEBT.

The public debt of Mexico is represented by bonds drawing different rates of interest, some payable in gold and others in silver. In 1825, very soon after our independence, we contracted two loans in London, both for 10,000,000 pounds sterling, which we mainly used for buying war-ships and war material. On account of the disturbed condition of the country, the interest on that debt could not be paid punctually, and the bonds naturally fell to a very low nominal price. In 1851, after the war with the United States, we refunded that debt in new bonds, the interest of which was reduced from 5 to 3 per cent., which we expected to pay punctually, but the disturbed condition of the country made it impossible for us to do it. Finally, in 1888, the debt was readjusted and gold bonds bearing 6 per cent. interest issued, and as we have paid since punctually the interest, they have reached par.

We had issued bonds from 1849 to 1856 to pay claims of English, French, and Spanish subjects under certain conventions signed with those countries, and such bonds were exchanged at different rates for the 6 per cent. gold bonds of our foreign debt.

VOL. I—9

To build the Tehuantepec Railway we negotiated in London, in 1888, another gold loan for 3,000,000 pounds sterling at 5 per cent. interest.

The subsidies granted to railway companies were payable in silver, with a percentage of our import duties, but as they amounted to a considerable sum their payment reduced the revenue considerably, and the Mexican Government contracted in London in 1890 a gold loan at 6 per cent. interest, with which it paid the subsidies due up to that date to most of the railway companies.

We had to issue besides in 1850 what we call domestic or interior bonds, at 3 and 5 per cent. interest in silver, and we had other indebtedness of several kinds, caused by loans and other sources when the revenue of the Government was not enough to pay its expenses. All such debts have been consolidated into new bonds of 3 and 5 per cent. interest, payable in silver. Such railway subsidies as were not paid out of the proceeds of the loan of 1890 have been paid with bonds drawing 5 per cent. interest, paying both capital and interest in silver.

It is very onerous for Mexico when it is on a silver basis to pay in gold the interest of its foreign debt, because we have to buy gold at current prices, and it costs us now more than double its current price. When silver was about 50 cents on the dollar, as compared with gold, 6 per cent. interest of our foreign debt, cost us 12 per cent., and of course the further silver is depreciated the greater will be the cost of paying the interest of our gold debts.

President Diaz gives in his report of November 30, 1896, the following data about the cost to the Mexican Treasury of buying exchange to place in London the funds to pay us the gold interest on our foreign debt :

Fiscal year 1888-1889.....	\$ 729,178.17
" " 1890-1891.....	2,314,477.77
" " 1891-1892.....	3,225,246.77
" " 1892-1893.....	5,101,223.57

In the second part of this paper I will give a detailed statement showing the different kinds of bonds and obligations which constitute the Mexican debt, and here will only give the figures of the total amount, which are the following :

Sterling Mexican debt.....	\$114,675,895.49
Debt payable in silver.....	88,549,111.80
Total.....	<u>\$203,225,007.29</u>

It is not possible to fix the exact amount of the debt of Mexico, either in silver or gold, because of the daily changes in the price of

silver ; but as silver is the currency of the country, when the Mexican dollar is worth 24 pence in London, the amount of our debt in silver would be equal to our sterling debt, that is : \$114,675,895.40 added to our debt will make a grand total in Mexican silver of \$317,900,902.78.

BANKING.

Banking in Mexico is in its incipient state. The National Bank of Mexico, established in the City of Mexico in 1882, with its branches in the principal cities of the country, has a monopoly for the issuing of notes in the capital which is only shared by such banks as were in existence before the National Bank of Mexico was chartered, like the Bank of London, Mexico, and South America, established during the French intervention in Mexico and recently remodelled under the name of the Bank of London and Mexico. The Mortgage Bank of Mexico enjoys that privilege also.

On June 3, 1896, a general banking law was issued by the Mexican Congress, which establishes the conditions under which banking institutions can be organized ; but, of course, that does not affect the rights of the National Bank and other banks in the City of Mexico which had been chartered before the date of that law.

Formerly, owing to the expense and dangers of transportation, it was difficult to transport money from one place to another, and therefore exchange between cities in Mexico was very high, sometimes even ten per cent. from one city to another in the country. The rate has been reduced considerably since the railroads were built, but it is still quite high. To draw money from the City of Mexico to the City of Oaxaca, for instance, and vice versa, costs now one per cent. each way ; when money is required to be sent to smaller places the expenses are much higher, as it is necessary to send a man to the nearest town where the money can be placed by the banks, and pay to him a large commission—the expenses sometimes reaching ten per cent. To keep up this rate of exchange the National Bank makes its bills payable at a certain place so that they cannot be paid at any other.

Banking is very profitable in Mexico. The following is a statement of the earnings and dividends of the National Bank of Mexico, which began with a capital of \$3,000,000, increased since to \$6,000,000, having now a reserve fund of \$5,500,000, and is owned almost exclusively by Mexicans, being the fiscal agent of the Government :

	NET PROFITS.	DIVIDENDS.
1891.....	\$1,813,623	23 per cent.
1892.....	1,839,418	23 " "
1893.....	2,355,464	29 " "
1894.....	1,961,801	24 " "
1895.....	2,200,626	27 " "

The following is a statement, from official sources, of the earnings and dividends of the Bank of London and Mexico. Up to 1891 it had a capital of \$1,500,000, which was then increased to \$3,000,000 :

	NET PROFITS.	DIVIDENDS EARNED, PER CENT.	DIVIDENDS DECLARED, PER CENT.
1889.....	\$243,246	16	10
1890.....	569,351	36	20
1891.....	703,522	46	20
1892.....	789,967	26	16
1893.....	618,653	20½	16
1894.....	603,178	20	14
1895.....	557,710	18½	14

Recently the capital stock of this bank was further increased to \$10,000,000, without any expense to the stockholders, as the reserve fund, which amounted to about \$2,000,000, was used to complete the new capital, and was issued to the regular stockholders as a stock dividend. The balance to complete the \$5,000,000 of new stock was offered to the public, the subscriptions amounting to \$22,000,000, or \$17,000,000 more than was wanted.

From this statement it will be seen that the existing banks are prosperous and in a flourishing condition, but the demand for increased banking facilities is such that new banks are being formed, and the operations of the old banks increased and extended in various directions.

PATENTS AND TRADE-MARKS.

Patents.—On June 7, 1890, the present patent law of Mexico was issued, and its provisions are very similar to the respective laws existing in this country.

Since the date of that law the following patents have been issued by our Department of Fomento :

YEARS.	PATENTS.	INCREASE.	DIMINUTION.
1890.....	63	....	....
1891.....	153	90	....
1892.....	168	15	....
1893.....	122	....	46
1894.....	125	3	....
1895.....	154	29	....
	785		

Trade-Marks.—On November 28, 1889, our present law regulating trade-marks was promulgated, and since then the following trade-marks have been issued by the Department of Fomento :

YEARS.	TRADE-MARKS.	INCREASE.	DIMINUTION.
1890.....	97	....	....
1891.....	112	15	....
1892.....	161	49	....
1893.....	108	....	53
1894.....	79	....	29
1895.....	91	12	....
	648		

SHIPPING.

The mercantile marine of Mexico in 1895 comprised 52 steamers and 222 sailing vessels. The shipping included also many small vessels engaged in the coasting trade.

In 1893-94, in the foreign trade, 1237 vessels of 1,314,625 tons entered, and 1211 vessels of 1,296,834 tons cleared the ports of Mexico. In the coasting trade 7721 of 1,623,371 tons entered and 7708 of 1,592,754 tons cleared. In 1894-95, in the foreign and coasting trade, there entered 9575 vessels of 3,428,973 tons, and cleared 9557 of 3,359,684 tons.

In the statistical portion of this chapter I will give official information about the number of vessels and their tonnage, which have entered and cleared from Mexican ports in recent years, the nations from which they came, and other valuable data.

MONEY, WEIGHTS, AND MEASURES.

The standard of value is silver. There is no paper currency except ordinary bank notes.

The silver peso or dollar of 100 centavos is the unit of coin in Mexico.

The silver peso weighs 27.073 grammes, .902 fine, and thus contains 24.419 grammes of fine silver.

The 10-pesos gold-piece weighs 27.0643 grammes, .875 fine, and thus contains 23.6813 grammes of fine gold.

The weights and measures of the metric system were introduced in 1856; but the Indians and other ignorant people use the old Spanish measures. The principal ones are these:

Weight.—1 libra=0.46 kilogramme, 1.014 lbs. avoirdupois.

1 arroba=25 libras, 25.357 lbs. avoirdupois.

For Gold and Silver.—1 marco= $\frac{1}{2}$ libra, 4,608 granos.

1 ochava=62 tomines.

1 tomin=12 granos.

20 granos=1 French gramme.

Length.—1 vara=0.837 metre = 2 ft. $8\frac{1}{10}$ English inches.

1 legua comun (1 common league) = 5,000 yards.

1 legua marina (1 marine league) = 6,666 $\frac{2}{3}$ yards.

NON-OFFICIAL PUBLICATIONS.

The following is a partial and rather incomplete list of (principally English) books about Mexico :

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 ROUTIER, G., *Le Mexique de nos Jours*. Paris, 1895.
 SCHROEDER, SEATON, *The Fall of Maximilian's Empire as seen from a United States Gunboat*. New York, 1887.
 SCOBEL, A., "Die Verkehrswege Mexicos und ihre wirtschaftliche Bedeutung." In *Deutsche Geographische Blätter*. Band X, Heft 1. Bremen, 1887.
Through the Land of the Aztecs; or, Life and Travel in Mexico. By a "Gringo." London, 1892.
 WELLS, DAVID A., *A Study of Mexico*. New York, 1887.

PART II.

STATISTICS

II. STATISTICS.

I do not know of any publication in which the latest statistical information about Mexico is compiled in a concise and complete form. One which perhaps is the fullest, published in Berlin by Messrs. Puttkammer & Muhlbrecht, entitled *Les Finances des Etats-Unis Mexicains*, written by Mr. Prosper Gloner, contains a great deal more statistical information than others, and is of later date.

It has required a great deal of work, energy, and time on my part to collect the data contained in this paper, most of which is of an official character, and I am sure it is the most complete ever published, I having tried to make it very concise, so as to take the smallest space possible.

REVENUES AND EXPENSES.

The financial question was for many years the leading and the most difficult one in Mexico, because the urgent needs of the Treasury, especially on account of the disturbed condition of the country, made public expenses considerably exceed the revenue, and this condition did not allow of a thorough overhauling and settlement of the finances, nor did it contribute to establish the credit of the Government; but peace having prevailed since 1877, a great improvement has taken place in the financial condition of Mexico; the revenue has increased considerably, and it has finally reached an amount amply sufficient to pay all our expenses. In fact, at the end of the fiscal year, ended June 30, 1896, we had for the first time in the history of Mexico since its independence, a surplus which amounted to \$6,000,000. The obnoxious tax which we inherited from the Spanish, called *alcabalas*, or interstate duties on domestic and foreign commerce, was a great drawback to internal trade, was finally abolished on July 1, 1896; and the country being now in a condition when radical reforms can be introduced without serious disturbances.

Our expenses as an independent nation are necessarily large, and as a comparatively small portion of our population are really producers

of wealth, upon them lies the whole burden of such expenses ; that is, we are a nation of from twelve to fifteen millions of inhabitants, with a very large territory and a large coast on both oceans, requiring army, revenue, light-house, and police service, and other expensive institutions proportionate to such extent and population, when the portion which contribute to such expenses is only about one-fourth or one-third of the same.

It is a very difficult task to give a complete and correct statement of the revenues and expenses of the Mexican Government prior to the year 1867. The disturbed condition of the country made it often quite impossible to keep any account at all : such was the case especially from 1858 to 1860, as during that period the City of Mexico and a large part of the country was occupied by the Church party under Miramon, and from 1863 to 1867 by the French Intervention. Besides that cause it was a very difficult matter for us to keep a correct account of public receipts and expenses, in some way for lack of a good system of book-keeping. To make a statement of the revenues and expenses of the Mexican Government since the independence of the country from Spain, I had to rely upon the reports made by Secretaries of the Treasury, which are, however, lacking for many years, and which contain rather an estimate than an account of the revenues and expenses, and I have made in that way the statement which I append under No. 1, which embraces the revenues and expenses from the year 1808, the last of the Spanish rule in Mexico, to the year 1867.

The forming of accounts was under the charge of the Federal Treasury of Mexico, and the Treasury kept its accounts with a very defective system of book-keeping, which prevented them from being correct. To remedy that difficulty, after the restoration of the Republic in 1867, a bureau of accounts was established in the Treasury Department, but its accounts were seldom correct, because it did not have the necessary detailed data to make a complete account, and, as could be expected, the results in the accounts of both bureaus differ widely.

In 1880 the Federal Treasury was reorganized with a large number of clerks with a view to keep a full and correct account of public moneys, and from that year until 1888 their accounts began to be better than before. In 1888 the system was still remodelled and improved, and since then that office has been able to keep correct and complete accounts of our public revenues and expenses.

I also append a statement No. 2 of the revenues and expenses of the Mexican Treasury from July 1, 1867, to June 30, 1888. The first thirteen years in that statement are taken from the data furnished by the Bureau of Accounts of our Treasury Department. The account of the year 1879-1880 was taken from the account of the Federal

Treasury, and the data for the year 1880-1881 from the accounts published by the Liquidating Bureau established by the Mexican Government to close the old accounts and open the new ones under the new system. The accounts of the year 1888-1889, which appear in statement No. 3, are all taken from the Federal Treasury of Mexico, and are complete and correct.

I also append a statement of the appropriations approved by the Federal Congress during the fiscal years from 1868 to 1895. The actual expenses never exceeded the appropriations and the revenue was generally below them.

NO. 1.—REVENUE AND EXPENSES OF THE FEDERAL GOVERNMENT OF MEXICO IN 1808 AND FROM 1822 TO JUNE 30, 1867.

	REVENUE.	EXPENSES.
1808, Colonial period.....	\$20,075,362 25	.....
1822, Independence period.....	9,328,740 00	\$13,455,377 00
1823.....	5,249,858 96	3,030,878 50
1824.....	15,254,601 03	15,165,876 05
1825 to Sept. 1st.....	7,903,163 42	13,110,187 24
Sept. 1, 1825, to June 30, 1826.....	14,770,733 30	13,112,200 65
1826-27.....	17,017,016 59	16,364,218 36
1827-28.....	13,644,974 69	12,982,092 86
1828-29.....	14,593,307 69	14,016,978 27
1829-30.....	14,103,773 28	13,728,491 39
1830-31.....	18,392,134 96	17,601,289 67
1831-32.....	17,582,929 15	16,937,384 67
1832-33.....	20,563,360 77	22,392,607 90
1833-34.....	21,124,216 81	19,934,490 42
1834-35.....	18,353,283 00	12,724,686 62
1835-36.....	26,382,303 90	17,766,262 81
1836-37.....	17,327,706 15	19,181,138 95
1837-38.....	25,018,121 77	26,588,305 03
1839.....	29,136,536 64	27,318,729 73
1840.....	21,227,263 43	21,235,097 67
1841.....	23,995,766 52	22,997,220 18
1842.....	30,682,369 40	30,639,711 00
1843.....	34,138,581 72	34,035,277 13
1844.....	31,873,019 47	31,260,225 87
1845.....	24,159,050 04	19,584,812 91
1846.....	24,026,938 36	27,845,487 28
1847.....	26,154,222 84	31,251,467 91
1848 to June 30, 1849.....	25,726,737 23	19,742,876 48
1849-50.....	18,281,835 38	17,291,233 25
1850-51.....	14,955,535 73	14,477,369 06
1851-52.....	11,022,291 17	10,475,686 10
1852-53.....	10,044,298 40	16,287,532 90
1853-54.....	19,028,975 00	18,726,088 00
1854-55.....	26,259,970 45	23,396,074 75
1855-56.....	15,855,597 47	12,920,257 65
1856-57.....	16,035,609 81	12,977,265 90
1857-58.....	15,529,887 47	15,927,102 01
1858-59.....	14,737,763 76	16,005,536 45
1859-60.....	14,306,675 28	16,589,034 47
1860-61.....	12,863,500 00	12,750,500 00
1861-62.....	15,500,000 00	15,300,600 00
1862-63.....	17,600,000 00	17,595,690 00
1863-64.....	7,000,000 00	6,990,000 00
1864-65.....	5,950,000 00	5,945,000 00
1865-66.....	5,057,500 00	5,053,250 00
1866-67.....	8,092,000 00	8,085,200 00

Revenue and Expenses.

141

NO. 3.—REVENUE AND EXPENSES OF THE MEXICAN GOVERNMENT FROM JULY 1, 1888, TO JUNE 30, 1896.

FISCAL YEARS.				REVENUE.				EXPENSES.			
	Cash.	Bonds.	Nominal.	Total.	Cash.	Bonds.	Nominal.	Total.	Cash.	Bonds.	Nominal.
1888-1889.—Revenue receipts.....	\$34,374,783 32	\$20,427,141 26	.....	\$54,801,924 58	\$40,325,109 50	\$20,103,595 45	\$4,493,624 48	\$73,924,329 43			
Loans.....	22,478,738 14	.....	.....	22,478,738 14	13,704,470 97	.....	.....	.....
Nominal.....	11,934,096 11	.....	\$50,147,312 08	62,081,408 19	\$63,089,580 47	.....	.....	54,272,265 53			
1889-1890.—Revenue receipts.....	\$68,787,617 57	\$20,427,141 26	\$50,147,312 08	\$139,362,070 91				\$58,765,890 01			
Loans.....	\$8,586,601 69	\$22,716,725 61	\$605,354 23	\$1,000,000 00	\$51,641,115 34	\$22,167,362 65	\$4,350,275 75	\$78,158,753 74			
Nominal.....	15,849,706 41	.....	20,775,715 65	15,849,706 41	41,653,849 84	.....	.....	45,016,373 95			
1890-1891.—Revenue receipts.....	\$74,044,833 91	\$22,716,725 61	\$30,381,069 88	\$127,142,629 40	\$55,804,965 18	\$22,167,362 65	\$49,366,649 70	\$127,138,977 53			
Loans.....	\$37,391,864 99	\$932,799 50	\$5,818,232 12	\$44,142,856 61	\$6,098,276 11	\$932,799 50	\$5,144,053 07	\$63,005,128 68			
Nominal.....	26,645,062 80	.....	3,614,283 94	30,260,346 74	10,360,242 26	.....	.....	65,086,034 91			
1891-1892.—Revenue receipts.....	\$3,328,685 36	\$932,799 50	\$66,797,551 92	\$70,126,537 28	\$67,288,518 37	\$932,799 50	\$70,230,087 98	\$75,446,277 17			
Nominal.....	\$67,366,753 15	.....	\$70,230,087 98	\$138,529,640 63				\$138,451,405 85			
1892-1893.—Revenue receipts.....	\$37,474,879 20	\$1,868,171 91	650,602 83	\$39,993,743 94	\$40,053,990 03	\$624,667 92	\$2,671,401 67	\$43,350,140 62			
Loans.....	5,485,005 10	.....	10,174,882 70	24,959,887 80	2,876,346 94	1,243,503 99	17,154,083 86	21,273,034 79			
Nominal.....	\$42,959,884 30	\$1,868,171 91	\$10,825,575 53	\$64,653,631 74	\$42,930,336 97	\$1,868,171 91	\$19,823,575 53	\$64,624,084 41			
1893-1894.—Revenue receipts.....	\$37,692,293 31	\$847,113 46	\$115,363 54	\$38,654,770 31	\$42,813,455 71	\$869,887 31	\$5,271,629 41	\$48,054,972 43			
Loans.....	4,566,983 82	.....	.....	4,566,983 82	.....	.....	.....	.....
Nominal.....	\$47,704,131 69	796,400 11	\$17,697,168 70	\$67,160,277 50	\$5,161,790 45	773,626 26	12,541,002 83	18,476,419 54			
1894-1895.—Revenue receipts.....	\$40,211,747 13	\$852,565 02	\$152,581 36	\$41,216,893 51	\$41,552,162 16	\$361,887 64	\$3,799,741 67	\$45,713,701 47			
Loans.....	6,053,794 09	.....	3,300,000 00	9,353,794 09	.....	.....	.....	.....
Nominal.....	2,054,225 12	69,800 59	\$16,421,707 23	\$18,542,822 94	7,092,362 90	560,477 97	16,074,636 92	23,727,477 79			
1895-1896.—Revenue receipts.....	\$48,319,766 34	\$922,365 61	\$19,874,378 59	\$69,116,510 54	\$48,644,525 06	\$922,365 61	\$19,874,378 59	\$69,444,269 26			
Loans.....	\$3,945,699 05	\$2,530,518 70	\$430,905 41	\$46,907,123 16	\$41,372,264 63	\$1,892,098 19	\$4,389,803 96	\$45,655,026 78			
Nominal.....	4,577,500 00	.....	21,721,500 00	6,750,000 00	.....	.....	.....	.....
1896-1897.—Revenue receipts.....	2,468,360 08	470,000 00	29,691,066 91	32,829,421 59	9,368,711 42	1,107,500 51	30,104,662 36	40,860,934 29			
Nominal.....	\$50,991,559 73	\$3,000,518 70	\$32,404,466 32	\$86,486,544 75	\$50,740,976 05	\$3,000,518 70	\$32,404,466 32	\$86,235,961 07			
1897-1898.—Revenue receipts.....	\$50,521,470 42	\$477,033 98	\$241,552 55	\$51,240,056 95	\$45,070,123 13	\$1,892,098 19	\$4,389,803 96	\$51,240,056 95			
Nominal.....	708,277 66	5,121,667 46	6,240,637 41	12,070,582 53	5,399,533 73	.....	.....	17,447,697 59			
	\$51,229,748 08	\$5,598,701 44	\$6,418,219 96	\$63,310,639 48	\$50,460,566 86	\$5,598,701 44	\$6,418,219 96	\$62,550,548 26			

FEDERAL APPROPRIATIONS DURING THE FISCAL YEARS FROM 1868 TO 1895.

FISCAL YEARS.	POWERS.				DEPARTMENTS.						TOTALS.
	Legislative.	Executive.	Judicial.	Foreign Affairs.	Interior.	Justice and Education.	Fomento and Colonization.	Communications and Public Works.	Treasury and Public Credit.	War and Navy.	
1868-1869.	\$735,360 00	\$52,880 00	\$483,300 00	\$124,540 00	\$1,025,080 00	\$380,640 75	\$2,202,932 00	.....	\$5,123,765 24	\$8,470,930 86	\$18,604,388 85
1869-1870.	754,300 00	46,325 00	265,000 00	128,540 00	1,437,600 84	377,613 18	3,003,180 00	.....	4,972,722 00	8,077,935 00	18,724,432 22
1870-1871.	767,610 99	48,172 40	280,060 00	130,160 00	1,464,512 24	374,437 99	4,341,771 12	.....	4,654,292 80	8,443,801 48	20,828,385 01
1871-1872.	811,080 00	48,172 40	280,060 00	130,160 00	1,464,512 24	374,437 99	4,341,771 12	.....	4,654,292 80	8,443,801 48	20,828,385 01
1872-1873.	811,080 00	48,172 40	280,060 00	130,160 00	1,464,512 24	374,437 99	4,341,771 12	.....	4,654,292 80	8,443,801 48	20,828,385 01
1873-1874.	877,000 00	48,172 40	280,060 00	130,160 00	1,464,512 24	374,437 99	4,341,771 12	.....	4,654,292 80	8,443,801 48	20,828,385 01
1874-1875.	844,610 00	48,172 40	280,060 00	130,160 00	1,464,512 24	374,437 99	4,341,771 12	.....	4,654,292 80	8,443,801 48	20,828,385 01
1875-1876.	1,074,162 00	48,172 40	343,498 00	248,760 00	1,954,131 30	862,092 80	4,337,483 00	.....	5,021,688 75	10,444,601 52	22,938,422 76
1876-1877.	1,044,270 00	48,172 40	343,498 00	248,760 00	1,954,131 30	862,092 80	4,337,483 00	.....	5,021,688 75	10,444,601 52	22,938,422 76
1877-1878.	957,310 12	48,172 40	343,498 00	248,760 00	1,954,131 30	862,092 80	4,337,483 00	.....	5,021,688 75	10,444,601 52	22,938,422 76
1878-1879.	1,051,322 00	48,172 40	343,498 00	248,760 00	1,954,131 30	862,092 80	4,337,483 00	.....	5,021,688 75	10,444,601 52	22,938,422 76
1879-1880.	986,242 00	48,172 40	343,498 00	248,760 00	1,954,131 30	862,092 80	4,337,483 00	.....	5,021,688 75	10,444,601 52	22,938,422 76
1880-1881.	1,022,824 00	48,172 40	343,498 00	248,760 00	1,954,131 30	862,092 80	4,337,483 00	.....	5,021,688 75	10,444,601 52	22,938,422 76
1881-1882.	990,402 00	48,172 40	343,498 00	248,760 00	1,954,131 30	862,092 80	4,337,483 00	.....	5,021,688 75	10,444,601 52	22,938,422 76
1882-1883.	1,071,712 00	48,172 40	343,498 00	248,760 00	1,954,131 30	862,092 80	4,337,483 00	.....	5,021,688 75	10,444,601 52	22,938,422 76
1883-1884.	1,015,632 00	48,172 40	343,498 00	248,760 00	1,954,131 30	862,092 80	4,337,483 00	.....	5,021,688 75	10,444,601 52	22,938,422 76
1884-1885.	1,067,932 00	48,172 40	343,498 00	248,760 00	1,954,131 30	862,092 80	4,337,483 00	.....	5,021,688 75	10,444,601 52	22,938,422 76
1885-1886.	1,007,144 15	49,251 50	432,392 90	417,762 00	2,401,610 10	1,252,370 85	3,750,077 00	.....	4,642,377 67	8,514,476 13	27,011,599 08
1886-1887.	1,052,913 45	49,251 50	432,392 90	417,762 00	2,401,610 10	1,252,370 85	3,750,077 00	.....	4,642,377 67	8,514,476 13	27,011,599 08
1887-1888.	1,002,928 75	49,251 45	430,004 45	434,972 00	2,401,610 10	1,252,370 85	3,750,077 00	.....	4,642,377 67	8,514,476 13	27,011,599 08
1888-1889.	1,053,830 40	49,248 19	440,005 45	434,972 00	2,401,610 10	1,252,370 85	3,750,077 00	.....	4,642,377 67	8,514,476 13	27,011,599 08
1889-1890.	1,002,928 75	49,240 45	468,284 25	462,517 25	2,401,610 10	1,252,370 85	3,750,077 00	.....	4,642,377 67	8,514,476 13	27,011,599 08
1890-1891.	1,054,020 50	49,840 45	476,784 50	558,483 54	2,401,610 10	1,252,370 85	3,750,077 00	.....	4,642,377 67	8,514,476 13	27,011,599 08
1891-1892.	1,000,000 00	49,977 20	476,083 90	590,379 84	2,401,610 10	1,252,370 85	3,750,077 00	.....	4,642,377 67	8,514,476 13	27,011,599 08
1892-1893.	1,050,638 06	49,977 20	476,083 90	553,360 80	2,401,610 10	1,252,370 85	3,750,077 00	.....	4,642,377 67	8,514,476 13	27,011,599 08
1893-1894.	1,005,638 00	49,977 30	476,171 50	516,965 50	2,401,610 10	1,252,370 85	3,750,077 00	.....	4,642,377 67	8,514,476 13	27,011,599 08
1894-1895.	1,005,638 00	49,977 30	476,171 50	516,965 50	2,401,610 10	1,252,370 85	3,750,077 00	.....	4,642,377 67	8,514,476 13	27,011,599 08
Totals..	\$26,139,808 42	\$1,324,056 64	\$11,437,427 75	\$8,645,445 03	\$68,824,781 15	\$31,536,483 47	\$19,067,202 75	\$7,260,153 97	\$22,331,921 01	\$276,779,966 34	\$784,637,936 53

Sources of Revenue.—The Federal revenue of Mexico consists mainly of three sources : import duties, internal revenue, and direct taxes in the Federal District. Under the head of import duties we collect duties on imports, extra import duties which we call additional duties, and duties on exports.

The sources of revenue of the Mexican Federal Treasury during the fiscal year 1895-1896, were :

Imposts on foreign trade.....	\$23,658,692 61
Internal revenue....	20,447,096 42
Direct taxes in the Federal District and Territories	3,357,611 81
Public services.....	1,811,045 30
Nominal.....	1,955,301 94
Total.....	\$51,229,748 08

Import Duties.—Our tariff is a highly protective one, as we have always maintained a very high rate of import duties, almost prohibitory for a large portion of our population, which under such a system are practically excluded from the use of foreign commodities, to the material detriment of the fiscal revenue, the public wealth at large, and the advancement of the masses of our people. The causes which have induced such a high tariff are twofold : first, that, in a great measure, protective ideas have prevailed ; secondly, and especially, the need of revenue, and the idea that the higher the rate of duties the larger would be the revenue collected. A new source of protection has been created by the depreciation of our currency, which acts as a powerful protection to our home commodities, in favor of our manufacturers to the disadvantage of the great body of consumers.

The protective policy in Mexico has been so deeply rooted that notwithstanding that I lean to freer trade, and that I have been three times at the head of the Treasury Department, and once for five years, I never was able to modify substantially that policy, because the condition of the Treasury was so precarious, that it would have been very rash to attempt any radical change on the face of a great reduction of an insufficient revenue which would have brought about disastrous results. For the same reason I was unable to do away with the obnoxious alcabala tax.

Our present tariff is divided into the following sections : 1st, animal industry ; 2d, agricultural products ; 3d, metals and its manufactures ; 4th, fabrics ; 5th, chemicals, oils, and paints ; 6th, wines, liquors, and fermented drinks ; 7th, paper ; 8th, machinery ; 9th, carriages ; 10th, arms and explosives, and 11th, sundries.

Additional Import Duties.—The additional duties collected by the Custom-houses are $1\frac{1}{2}$ per cent. of the amount of the import duties, which is levied for the respective municipality; 2 per cent. of the same duties, for harbor improvements; and 2 per cent. in revenue stamps, making in all $5\frac{1}{2}$ per cent. of the import duties. The custom-houses collect besides the import duties, tonnage and light-house duties, and pilot fees.

Export Duty.—Our export duties are levied upon cabinet and dye-woods, india rubber, cochineal, coffee, henequen, ixtle, indigo, sequila, jalap, tamarind, tobacco, mother-of-pearl, orchilla, vanilla, zacaton, and onyx.

The following statement shows the amount of export duties collected in Mexico from the fiscal year 1881-1882 to 1894-1895, expressing the commodities in which they were collected:

STATEMENT OF THE RECEIPTS FROM EXPORT DUTIES IN MEXICO FROM
JULY 1, 1881, TO JUNE 30, 1895.

FISCAL YEAR.	RECEIPTS.	COMMODITIES TAXED.
1881-1882.....	\$122,462 24	Orchilla, wood.
1882-1883.....	144,597 93	" "
1883-1884.....	179,439 97	" "
1884-1885.....	161,811 47	" "
1885-1886.....	107,484 80	" "
1886-1887.....	106,859 63	" "
1887-1888.....	114,869 04	" "
1888-1889.....	81,849 25	" "
1889-1890.....	98,386 12	" "
1890-1891.....	86,859 86	" "
1891-1892.....	96,560 48	" "
1892-1893.....	91,475 54	" "
1893-1894.....	1,045,105 44	Orchilla, wood, henequen, coffee.
1894-1895.....	1,227,719 24	Orchilla, wood, henequen, coffee, skins, zacaton, chewing gum, ixtle, vanilla.

Amount of Import Duties.—It is very difficult to give a correct statement of the receipts of the Mexican custom-houses before the year 1875. I append, however, one made from the reports of the Secretaries of the Treasury of Mexico, especially those of July 25, 1839, and September 16, 1870, and completed from the years 1839-1851, with data obtained from the *Comercio exterior de Mexico*, by D. Miguel Lerdo de Tejada. From the fiscal year 1875-1876, the Statistical Bureau of our Treasury Department began to publish detailed and correct statements of the custom receipts, and I append one embracing the fiscal years from 1875 to 1896 which shows how largely our import duties have increased. In the ten years elapsed from 1878 to 1888 the increase was over 67 per cent. as compared with the corre-

sponding period from 1869-1879, and the increase in the last seven years, 1889-1896, was 16 per cent. as compared with the previous ten years, both periods making an increase of nearly 100 per cent. over the first ten years of said statement :

CUSTOMS RECEIPTS FROM 1823 TO THE FISCAL YEAR ENDING JUNE 20, 1875.

1823. From April 1st to September 30 the receipts were \$971,345 77, which for a year of 12 months would be.....	\$1,942,691 54
1825. From the 1st of January to the 1st of August, 1825, the receipts were \$4,472,069 37, which for a year of 12 months would be.....	7,666,404 63
1825-1826 From the 1st of September, 1825, to June, 1826, \$6,414,383 26, which for a year of 12 months would be.....	9,621,574 89
1826-1827.....	7,828,208 44
1827-1828.....	5,692,026 70
1828-1829.....	6,497,288 93
1829-1830.....	4,815,418 25
1830-1831.....	8,287,082 92
1831-1832.....	7,335,637 76
1832-1833.....	7,538,525 47
1833-1834.....	8,786,396 94
1834-1835.....	8,920,408 28
1835-1836..	5,835,068 51
1836-1837.....	4,377,579 52
From July 1, 1837, to December 31, 1838, \$4,258,411 10.	
Corresponding to one year of 12 months.....	2,838,940 73
1839.....	5,577,890 67
1840.....	8,309,918 65
1841.....	6,597,912 32
1842.....	6,034,342 29
1843.....	8,507,478 79
1844.....	8,254,141 96
1845.....	5,814,048 69
1846.....	6,747,932 35
1847.....	1,394,609 52
From January 1, 1848, to June 30, 1849, 18 months...	6,660,037 96
From July, 1849, to June, 1850.....	6,338,437 50
1850-1851.....	5,337,068 62
From July 1, 1851, to June 30, 1852.....	6,108,835 26
1852-1853, according to the calculations of M. Haro y Tamariz average from the preceding five years.	4,906,533 17

1853-1854, according to the report of M. Olazagarre (1855).....	8,399,208	93
1854-1855, according to the report of M. Lerdo de Tejada (1857).....	8,096,208	85
1855-1856, according to the report makes the receipts for the first six months amount to \$3,379,761 35, which for the year is.....	6,759,522	70
1856-1857, average for the six years previous.....	6,854,061	78
1857-1858 " " " "	6,854,061	78
1858-1859 " " " "	6,854,061	78
1859-1860 " " " "	6,854,061	78
1860-1861 " " " "	6,854,061	78
1861-1862 " " " "	6,854,061	78
1862-1863 " " " "	6,854,061	78
1863-1864 " " " "	6,854,061	78
1864-1865 " " " "	6,854,061	78
1865-1866 " " " "	6,851,061	78
1866-1867 " " " "	6,851,061	78
1867-1868, according to the amount of the receipts....	9,566,360	99
1868-1869 " " " "	9,606,491	73
1869-1870.....	7,824,525	57
1870-1871.....	10,014,277	60
1871-1872.....	8,430,211	00
1872-1873.....	11,833,117	52
1873-1874.....	13,981,795	42
1874-1875.....	11,821,533	49
Total.....	\$367,725,836	01
Average in one year.....	\$7,071,650	69

Internal Revenue.—The Federal Treasury of Mexico depended up to 1867 mainly upon import duties, and as it was not safe to have only that source of revenue, when I occupied for the first time the Treasury Department, I introduced a system of internal revenue through the use of stamps, which met with a great deal of opposition at the time, but which has finally been developed very largely, yielding now almost as much as the import duties. The receipts during the six months from January 1st to June 30th, 1875, amounted to \$1,097,668 28, which in a whole year would make, duplicating it, \$2,195,336 56, while in the fiscal year ended June 30, 1896, the receipts amounted to \$18,078,952 54, or nearly eight times as much.

We have had since 1861 a comparative large source of revenue called Federal Tax, which up to 1892 was 25 per cent. of all the revenues collected by the States and Municipalities in Mexico. That rate

Revenue and Expenses.

147

RECEIPTS OF THE CUSTOM-HOUSES DURING THE TWENTY-SEVEN FISCAL YEARS ENDING JUNE 30, 1896.

FISCAL YEARS.	IMPORT DUTIES.			EXPORT DUTIES.		TOTAL GROSS RECEIPTS.	COST OF COLLECTION.		NET RECEIPTS.
	Tariff.	Additional.	Total.	Previous metals.	Commodities.		Annual expenditures.	Percentage.	
1869-1870.....	\$ 4,026,046 61	\$ 2,203,833 78	\$ 7,230,880 39	\$ 1,570,901 87	.....	\$ 8,801,531 66	\$ 493,346 90	5.706	\$8,017,184 76
1870-1871.....	5,004,768 00	4,316,886 59	9,411,654 59	1,473,899 13	.....	10,884,953 72	566,228 51	5.200	10,318,725 21
1871-1872.....	4,464,410 76	3,681,849 73	8,146,260 51	914,510 72	.....	9,060,771 23	471,690 42	5.205	8,589,080 81
1872-1873.....	8,008,293 80	134,211 38	8,142,505 18	1,063,700 30	.....	9,206,205 48	553,049 99	5.983	8,653,155 49
1873-1874.....	10,354,158 85	74,347 38	10,428,506 23	881,048 30	.....	11,309,554 53	575,591 80	5.090	10,733,962 73
1874-1875.....	8,800,033 06	71,236 40	8,871,269 46	854,873 90	.....	9,726,143 36	718,036 74	7.090	9,008,106 62
1875-1876.....	8,390,676 79	60,306 05	8,450,982 84	786,843 55	.....	9,237,826 39	767,458 27	7.508	8,470,368 05
1876-1877.....	8,368,293 04	65,762 21	8,434,055 25	957,087 47	.....	9,391,142 72	632,041 27	6.781	8,759,101 45
1877-1878.....	12,367,461 71	65,762 21	12,433,223 92	1,009,766 06	.....	13,443,000 35	815,888 25	6.042	12,627,112 09
1878-1879.....	9,518,567 31	60,535 88	9,579,103 19	871,047 37	.....	10,450,150 56	815,888 25	7.706	9,634,262 31
1879-1880.....	11,718,864 37	60,535 88	11,779,400 25	886,340 75	.....	12,665,741 00	849,564 55	6.662	11,816,176 45
1880-1881.....	13,768,416 33	81,813 46	13,850,230 79	78,377 98	.....	13,928,608 77	993,055 14	6.715	12,935,553 63
1881-1882.....	17,001,061 83	66,044 34	17,067,106 17	109,887 52	.....	17,177,000 69	1,241,442 60	6.133	15,925,558 09
1882-1883.....	18,173,780 80	421,087 31	18,594,868 11	337,873 54	.....	19,032,741 65	1,397,690 19	7.257	17,635,051 46
1883-1884.....	15,302,567 28	855,225 91	16,157,793 19	.....	.....	17,277,333 16	1,364,472 99	7.685	14,993,320 17
1884-1885.....	17,623,880 15	128,068 87	17,751,948 02	.....	.....	18,938,820 94	1,897,313 06	10.811	16,034,507 86
1885-1886.....	17,028,215 27	276,495 74	17,304,711 01	.....	.....	19,201,149 17	1,897,313 06	9.995	15,407,400 05
1886-1887.....	18,028,772 18	260,495 74	18,289,267 92	.....	.....	20,186,512 99	1,897,313 06	9.995	16,392,000 86
1887-1888.....	21,172,759 17	685,077 76	21,857,836 93	.....	.....	23,755,146 85	2,077,459 86	9.916	19,679,687 07
1888-1889.....	20,172,759 17	685,077 76	20,857,836 93	.....	.....	22,935,372 30	2,077,459 86	9.916	18,780,376 07
1889-1890.....	20,172,759 17	685,077 76	20,857,836 93	.....	.....	22,935,372 30	2,077,459 86	9.916	18,780,376 07
1890-1891.....	20,172,759 17	685,077 76	20,857,836 93	.....	.....	22,935,372 30	2,077,459 86	9.916	18,780,376 07
1891-1892.....	20,172,759 17	685,077 76	20,857,836 93	.....	.....	22,935,372 30	2,077,459 86	9.916	18,780,376 07
1892-1893.....	20,172,759 17	685,077 76	20,857,836 93	.....	.....	22,935,372 30	2,077,459 86	9.916	18,780,376 07
1893-1894.....	20,172,759 17	685,077 76	20,857,836 93	.....	.....	22,935,372 30	2,077,459 86	9.916	18,780,376 07
1894-1895.....	20,172,759 17	685,077 76	20,857,836 93	.....	.....	22,935,372 30	2,077,459 86	9.916	18,780,376 07
1895-1896.....	20,172,759 17	685,077 76	20,857,836 93	.....	.....	22,935,372 30	2,077,459 86	9.916	18,780,376 07
Total in 27 years.....	\$376,341,901 23	\$19,097,570 30	\$395,439,471 53	\$12,554,066 33	\$4,992,997 03	\$412,986,614 86	\$35,066,276 76	8.048	\$377,919,338 11
Average per annum....	\$13,938,588 93	\$707,317 41	\$14,645,906 35	\$464,065 42	\$184,923 22	\$15,295,857 98	\$1,297,269 51	8.482	\$14,077,642 15

Abstract of sums and annual averages of the two periods of ten years and the last of seven years.

Totals and averages.	IMPORT DUTIES.			EXPORT DUTIES.		TOTAL GROSS RECEIPTS.	COST OF COLLECTION.		NET RECEIPTS.
	Tariff.	Additional.	Total.	Previous metals.	Commodities.		Annual expenditures.	Percentage.	
1869-79—Totals.....	\$70,764,770 27	\$11,718,574 33	\$82,483,344 60	.....	.....	\$101,550,040 58	\$6,334,825 43	6.238	\$95,215,215 15
1870-80—Totals.....	7,976,747 97	1,171,837 43	9,148,585 40	.....	.....	10,150,040 58	633,482 54	.....	9,515,057 94
1879-80—Totals.....	\$161,373,737 17	\$25,582,222 22	\$186,955,959 39	.....	.....	\$166,980,742 19	\$14,821,893 15	8.758	\$154,738,849 04
1889-96—Totals.....	\$133,310,493 79	\$800,223 75	\$134,110,717 54	.....	.....	\$141,865,832 12	\$13,840,558 90	9.765	\$120,325,273 62
Average.....	19,045,641 97	688,602 39	19,734,244 36	.....	.....	20,265,661 73	1,496,958 31	.....	18,768,703 42

was increased in 1893 from 25 to 33½ per cent. on account of the deficit caused to the Federal Treasury by the depreciation of silver, and that tax which is paid in Federal stamps, constitutes a very large portion of our internal revenue receipts.

I append a statement of our internal revenue taxes with full details.

INTERNAL REVENUE RECEIPTS FROM JANUARY 1, 1875, TO JUNE 30, 1896.

FISCAL YEARS.	GROSS RECEIPTS.	GROSS RECEIPTS OF THE FEDERAL TAX.	TOTAL RECEIPTS.	COLLECTION EXPENSES.		NET RECEIPTS.
					Per-centage.	
From January 1 to June 30, 1875...	\$328,631 26	\$760,037 02	\$1,097,668 28			
1875-1876.....	\$668,930 14	\$1,145,624 37	\$1,814,554 51	\$167,937 42	9.255	\$2,247,617 09
1876-1877.....	728,192 71	1,905,806 66	2,633,999 37	120,334 94	4.567	2,513,664 43
1877-1878.....	920,901 29	2,154,249 51	3,075,150 80	302,612 65	9.840	2,772,538 15
1878-1879.....	763,879 23	2,239,267 37	3,003,146 60	300,490 02	10.006	2,702,656 58
1879-1880.....	1,311,463 95	2,336,431 73	3,647,895 68	484,215 36	13.274	3,164,180 32
Average per annum in five years	\$878,673 46	\$1,956,275 93	\$2,834,949 39	\$275,118 08	9.705	\$2,680,131 31
1880-1881.....	\$1,037,730 93	\$2,371,369 31	\$3,409,100 24	\$351,080 01	10.325	\$3,057,120 23
1881-1882.....	1,489,685 61	2,775,149 84	4,264,835 45	376,095 30	8.843	3,888,710 15
1882-1883.....	1,591,189 33	3,099,179 93	4,690,369 26	420,132 04	9.000	4,270,237 22
1883-1884.....	1,919,461 99	2,914,967 08	4,834,429 07	441,080 10	9.126	4,393,348 87
1884-1885.....	3,231,872 75	3,127,487 85	6,359,354 60	489,043 89	7.690	5,870,310 71
Average per annum in five years	\$1,841,982 12	\$2,857,229 60	\$4,699,211 72	\$415,666 27	8.845	\$4,283,545 44
1885-1886.....	\$2,761,886 56	\$3,115,759 85	\$5,877,646 41	\$428,300 78	7.288	\$5,449,355 63
1886-1887.....	3,930,429 16	3,587,339 96	7,517,769 12	638,011 29	8.486	6,879,757 83
1887-1888.....	4,054,190 93	3,324,937 53	7,379,128 46	728,431 31	9.000	7,250,697 15
1888-1889.....	5,108,911 59	3,679,492 22	8,788,405 11	771,601 95	8.777	8,016,803 16
1889-1890.....	5,575,067 62	3,791,695 27	9,366,762 89	799,721 78	8.538	9,567,041 11
Average per annum in five years	\$4,406,097 17	\$3,490,845 23	\$7,905,942 40	\$673,237 42	8.516	\$7,432,710 98
1890-1891.....	\$5,624,340 94	\$3,865,650 40	\$9,489,991 43	\$853,834 28	8.955	\$8,636,157 15
1891-1892.....	5,402,495 76	3,060,087 88	8,462,583 64	868,161 60	9.263	8,504,322 04
1892-1893.....	6,625,265 53	4,431,022 65	11,056,288 18	945,076 71	8.548	10,111,211 47
1893-1894.....	9,164,063 10	5,216,547 31	14,380,610 41	1,120,760 85	7.790	13,259,849 56
1894-1895.....	10,008,795 63	5,471,173 92	15,560,969 55	1,146,419 41	7.363	14,414,550 14
1895-1896.....	12,519,676 93	5,559,253 61	18,078,930 54	1,196,053 14	6.616	16,882,877 40
Average in six years.....	\$8,239,106 31	\$4,752,272 98	\$12,991,379 29	\$1,021,717 67	7.865	\$11,969,661 63
Total in 21½ years.	\$85,397,032 94	\$70,849,428 66	\$156,246,461 60	\$12,950,384 83	8.288	\$143,799,008 30

Direct Taxes.—The third source of revenue of the Mexican Government are direct taxes collected in the Federal District, which includes the City of Mexico. They are levied on real-estate, scientific professions, commercial and industrial establishments, and work-shops. The real-estate for the purpose of this tax is divided into rural and urban, the former paying a tax of 12 per cent. on its rent when occupied, and 3 per cent. when not occupied, and the latter paying 8 per thousand of its registered value.

Taxes on professions vary from 50 cents to \$20.00 a month. The tax on commercial and industrial establishments is regulated by law. The commercial establishments, which pay license taxes are commis-

sion agencies of all kinds : banking firms ; dry goods, groceries, wines, furniture, and jewelry stores ; insurance companies ; restaurants, hotels, and boarding-houses. Among the industrial establishments are embraced especially railway, telegraph and telephone companies ; cotton, woollen, and silk mills ; factories of all kinds ; iron smelters ; printing, engraving, and photographic establishments ; coffee, corn, and flour mills, etc., etc.

When the alcabalas were abolished a direct tax was established upon some of the articles which paid the largest sums, namely : pulque, wheat flour, and domestic brandy distilled from molasses.

I annex a statement showing the proceeds of Direct Taxes in the Federal District during the last twenty-seven fiscal years.

RECEIPTS FROM DIRECT TAXES IN THE FEDERAL DISTRICT DURING
THE TWENTY-SEVEN FISCAL YEARS ENDING JUNE 30, 1896.

FISCAL YEARS.	GROSS RECEIPTS.	COLLECTION EXPENSES.	PER- CENTAGE EXPENSES.	NET RECEIPTS.
1869-1870.....	\$485,451 73	\$55,481 65	11.42	\$429,970 08
1870-1871.....	502,146 64	53,924 28	10.74	448,222 36
1871-1872.....	471,228 78	50,934 37	10.62	421,194 41
1872-1873.....	477,654 75	51,939 05	9.90	425,715 70
1873-1874.....	584,404 76	57,205 69	10.00	467,289 07
1874-1875.....	531,149 09	56,663 64	10.67	474,485 45
1875-1876.....	1,350,705 56	69,957 24	5.18	1,280,748 32
1876-1877.....	516,510 80	47,685 23	9.23	468,825 57
1877-1878.....	538,300 09	37,970 00	7.05	500,330 09
1878-1879.....	559,217 21	51,160 08	9.15	508,057 13
1879-1880.....	592,688 44	52,126 21	8.79	540,562 23
1880-1881.....	634,408 92	52,260 50	8.23	582,148 42
1881-1882.....	674,973 66	53,161 23	7.87	621,812 43
1882-1883.....	753,579 80	98,264 24	13.06	655,315 56
1883-1884.....	830,010 26	100,937 90	12.16	729,072 36
1884-1885.....	1,002,656 37	89,892 38	8.93	1,002,763 99
1885-1886.....	1,023,349 52	91,464 07	8.97	931,885 45
1886-1887.....	1,040,143 16	84,861 27	8.16	955,281 89
1887-1888.....	1,074,489 54	121,011 50	11.26	953,478 04
1888-1889.....	1,125,202 97	97,635 14	8.68	1,027,567 83
1889-1890.....	1,213,458 49	100,134 87	8.25	1,113,323 62
1890-1891.....	1,306,746 37	103,740 02	7.35	1,203,006 35
1891-1892.....	1,369,225 30	104,320 34	7.62	1,264,904 96
1892-1893.....	1,436,875 70	115,817 86	8.06	1,321,057 84
1893-1894.....	1,445,270 81	110,290 73	7.63	1,334,980 08
1894-1895.....	1,497,251 90	108,255 57	7.36	1,388,996 33
1895-1896.....	1,620,480 35	110,347 13	6.81	1,510,133 22
Totals in the 27 years.....	\$24,687,760 97	\$2,126,542 19	.....	\$22,561,218 78
Average per annum.....	912,028 18	78,760 82	8.65	835,600 69
Totals and Annual averages of the first five years.....	\$2,460,976 66	\$268,585 04	.....	\$2,192,391 62
Annual average.....	492,195 33	53,717 01	11.14	438,478 32
Total of the second five years.....	\$3,495,882 75	\$263,436 19	.....	\$3,232,446 56
Annual average.....	699,176 55	52,687 24	7.54	646,489 31
Total of the third five years.....	\$3,485,751 08	\$356,750 08	.....	\$3,129,001 00
Annual average.....	697,150 21	71,350 02	10.42	625,800 20
Total of the fourth five years.....	\$5,355,841 56	\$484,864 36	.....	\$4,870,977 20
Annual average.....	1,071,168 31	96,972 87	9.05	974,195 44
Total of the fifth period of five years.....	\$6,771,576 67	\$534,303 82	.....	\$6,237,272 85
Annual average.....	1,354,315 33	106,860 76	7.89	1,247,454 57
Total of the sixth period of two years.....	\$3,117,732 25	\$218,602 70	.....	\$2,899,129 55
Annual average.....	1,558,866 13	109,301 35	7.01	1,449,564 78

REVENUES OF THE MEXICAN STATES FROM 1884 TO 1895.

STATES.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	TOTAL.
Aguascalientes.....	\$ 117,672	\$ 103,043	\$ 84,656	\$ 80,400	\$ 81,206	\$ 80,656	\$ 90,095	\$ 144,507	\$ 171,809	\$ 156,615	\$ 101,865	\$ 90,885	\$ 1,200,499
Campeche.....	136,841	132,038	177,045	190,516	176,553	223,024	239,860	260,410	247,951	252,495	283,777	279,210	2,601,538
Coahuila.....	220,586	186,211	195,283	220,679	220,795	220,795	431,218	273,318	323,666	333,843	341,093	380,757	3,339,450
Colima.....	118,237	126,420	126,420	95,870	103,871	116,186	130,237	171,951	158,370	175,383	170,534	163,681	1,657,166
Chiapas.....	136,015	154,510	125,218	143,322	135,126	183,279	204,332	220,608	274,749	441,590	359,184	421,428	2,868,201
Chihuahua.....	210,476	317,153	338,087	287,634	335,647	466,415	486,016	697,608	638,422	643,199	.....	.....	4,421,491
Durango.....	230,308	225,887	238,181	260,254	272,643	288,780	303,660	522,761	539,089	549,007	857,047	820,080	5,207,767
Guana juato.....	839,870	967,610	952,017	1,028,064	998,006	1,038,109	1,143,221	1,174,248	1,136,123	1,287,202	1,423,687	1,330,662	13,318,819
Guerrero.....	221,055	235,578	392,201	286,038	409,785	425,205	443,140	495,556	519,550	530,980	252,072	.....	4,213,259
Hidalgo.....	423,227	440,445	644,671	668,584	702,228	825,788	1,004,083	1,061,814	1,306,339	2,059,317	1,330,602	2,053,207	13,790,259
Jalisco.....	1,021,227	1,398,273	1,093,321	1,170,394	1,061,452	825,788	1,004,083	1,061,814	1,306,339	1,491,258	1,464,448	1,495,784	15,240,624
México.....	419,440	440,973	683,124	769,099	739,712	764,863	839,547	1,033,135	1,029,099	1,004,697	963,598	1,182,340	9,063,437
Michoacan.....	609,167	666,138	683,113	686,995	722,853	706,546	672,548	936,858	1,011,260	1,138,660	822,975	1,231,995	9,086,578
Morelos.....	328,066	359,653	338,982	338,169	347,233	336,256	359,811	437,187	418,697	436,433	407,824	360,992	4,466,273
New Leon.....	113,218	113,754	112,964	146,717	134,228	137,861	147,777	162,460	177,087	182,870	206,476	321,589	1,927,001
Oaxaca.....	680,207	714,471	.....	.....	.....	.....	.....	878,355	1,049,477	1,023,267	982,250	905,594	6,243,551
Puebla.....	890,854	919,633	889,463	988,163	1,126,934	1,019,703	1,062,274	1,564,890	1,384,228	1,106,544	1,231,527	1,144,009	13,338,219
Queretaro.....	210,810	216,115	248,271	233,526	245,415	266,692	266,875	374,189	337,363	307,530	422,812	352,144	3,201,931
San Luis Potosi.....	.....	.....	1,313,522	1,749,522	1,744,254	2,645,208	1,638,341	1,606,911	1,596,576	1,187,854	1,055,791	1,602,809	14,805,008
Sinaloa.....	355,604	429,792	391,882	497,793	412,857	494,995	499,354	618,284	623,574	704,022	573,994	577,144	6,086,216
Sonora.....	302,962	296,136	292,959	494,179	342,450	352,658	362,701	561,211	571,261	491,399	374,865	471,253	4,824,452
Tabasco.....	179,149	176,831	182,934	182,934	253,438	256,822	291,149	298,668	281,208	282,723	316,365	331,537	3,099,141
Tamaulipas.....	.....	.....	162,938	160,031	114,866	133,629	190,822	192,967	178,458	189,552	215,137	190,166	1,535,835
Tlaxcala.....	131,331	153,362	111,722	116,868	117,012	167,245	166,710	172,966	223,692	182,036	187,379	.....	1,023,400
Veracruz.....	722,466	771,516	812,722	739,222	686,818	770,213	866,383	1,039,182	982,359	867,044	572,141	.....	8,835,359
Yucatan.....	422,053	422,053	521,480	521,480	483,796	498,166	498,166	1,039,182	621,697	627,749	280,000	696,202	6,428,382
Zacatecas.....	338,895	756,831	680,960	710,170	744,144	737,477	730,672	1,251,160	1,297,738	1,216,893	1,186,183	726,819	10,467,914
Total.....	\$ 9,614,261	\$ 10,735,534	\$ 11,718,726	\$ 11,923,413	\$ 12,126,198	\$ 14,286,465	\$ 14,101,158	\$ 19,938,682	\$ 18,892,421	\$ 18,962,976	\$ 16,824,736	\$ 17,131,917	\$ 75,386,487
Federal Treasury..	37,422,625	30,359,637	28,797,799	32,126,509	40,962,045	54,801,924	61,908,081	44,424,956	39,993,743	36,654,770	41,216,893	46,997,123	497,374,535
Total.....	\$ 47,036,886	\$ 41,095,171	\$ 40,516,455	\$ 44,049,922	\$ 53,128,243	\$ 68,988,389	\$ 76,009,239	\$ 63,181,538	\$ 58,886,164	\$ 57,617,746	\$ 58,041,629	\$ 64,039,040	\$ 792,700,022

Revenue and Expenses.

151

EXPENSES OF THE MEXICAN STATES FROM 1884 TO 1895.

STATES.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	TOTAL.
Aguascalientes....	\$ 85,564	\$ 86,666	\$ 81,356	\$ 78,400	\$ 80,603	\$ 80,186	\$ 93,475	\$ 144,487	\$ 166,366	\$ 135,384	\$ 101,865	\$ 90,395	\$ 1,233,647
Campeche.....	134,901	133,486	177,150	180,492	168,558	217,778	244,186	250,866	244,872	244,742	265,180	267,288	3,547,433
Coahuila.....	234,935	183,466	190,436	176,418	186,093	210,031	231,168	266,094	317,445	320,073	341,023	304,073	3,000,043
Colima.....	115,030	124,474	124,474	100,348	100,845	114,487	131,770	171,440	162,195	168,548	163,611	159,592	1,638,998
Chiapas.....	135,370	135,231	125,052	142,815	135,107	181,885	195,978	174,740	268,293	430,040	359,018	423,103	2,728,525
Chihuahua.....	218,210	282,975	.....	.....	.....	.....	.....	639,574	614,605	611,159	.....	.....	2,305,832
Durango.....	264,619	217,555	235,065	243,311	263,616	282,654	357,368	506,563	516,407	539,315	856,912	799,997	5,004,282
Guajalato.....	.....	.....	.....	.....	.....	1,049,015	1,102,697	1,132,000	1,108,057	1,209,855	1,204,904	1,336,106	9,294,784
Guerrero.....	216,697	224,522	209,870	220,598	223,810	236,936	233,840	273,106	280,587	340,450	260,693	.....	2,742,682
Hidalgo.....	426,442	455,812	509,791	594,192	622,825	777,283	1,017,407	1,740,351	1,792,792	2,051,629	1,316,170	2,052,213	13,417,207
Jalisco.....	1,012,009	1,475,211	972,846	1,022,887	1,283,412	994,430	962,737	1,586,213	1,396,491	1,459,535	1,459,535	1,493,928	15,089,703
México.....	410,440	440,973	625,407	708,362	725,033	716,405	801,950	1,016,974	1,019,427	1,057,516	883,064	1,149,016	9,557,557
Michoacan.....	632,911	665,929	641,586	627,467	719,088	699,400	703,478	932,135	988,860	1,109,066	800,459	1,449,031	9,788,313
Morelos.....	327,057	356,038	342,412	326,511	351,425	336,390	355,109	433,756	418,697	436,427	394,229	333,742	4,413,793
New Leon.....	90,785	103,199	107,245	153,664	131,559	132,578	136,024	146,428	143,861	157,623	151,955	258,649	1,715,586
Oaxaca.....	742,927	681,918	.....	.....	.....	.....	.....	749,105	884,411	953,536	973,723	876,536	5,868,156
Puebla.....	894,686	945,462	889,011	987,925	1,112,660	987,160	1,055,360	1,518,055	1,361,284	1,084,620	1,212,622	1,128,049	13,179,194
Querétaro.....	212,759	215,702	248,136	228,023	251,004	257,158	294,797	374,185	337,362	307,343	419,301	350,846	3,496,816
San Luis Potosí.....	.....	.....	1,309,827	1,156,149	1,156,279	1,560,051	1,690,971	1,524,776	1,501,652	1,162,797	1,046,668	834,262	14,022,432
Sinaloa.....	353,959	428,201	304,760	401,099	417,246	402,448	403,781	614,419	617,355	692,662	543,784	581,051	6,033,676
Sonora.....	289,598	326,331	169,781	403,056	220,140	308,416	315,977	535,870	541,439	467,997	354,155	587,153	4,535,013
Tabasco.....	166,771	188,048	175,993	102,154	220,854	272,042	286,706	303,968	281,405	290,187	335,022	328,306	3,051,386
Tamaulipas.....	.....	.....	160,790	158,851	118,357	133,094	191,134	192,977	177,629	180,084	213,019	.....	1,526,838
Tlaxcala.....	135,101	128,311	116,790	128,826	118,723	161,773	172,780	172,500	168,199	180,411	185,960	184,284	1,002,997
Veracruz.....	708,666	760,873	750,070	739,293	772,118	771,677	772,765	772,506	954,051	799,019	542,611	841,767	8,417,671
Yucatan.....	371,562	430,712	440,000	444,200	487,658	487,658	487,658	632,215	632,215	632,215	672,728	672,728	6,297,609
Zacatecas.....	573,031	761,686	603,204	671,625	784,641	701,522	754,862	1,226,525	1,226,525	1,179,868	1,174,420	799,387	10,383,630
Total.....	\$ 8,766,700	\$ 9,759,004	\$ 9,701,121	\$ 10,136,566	\$ 10,697,922	\$ 13,149,777	\$ 13,061,925	\$ 18,029,303	\$ 18,226,394	\$ 18,301,264	\$ 17,212,175	\$ 16,211,699	\$ 163,329,000
Federal Treasury..	42,714,229	44,407,386	26,184,198	36,262,962	54,956,554	73,922,329	79,138,753	63,005,128	43,320,149	48,954,972	45,713,791	45,078,531	602,709,002
Total.....	\$ 51,480,929	\$ 54,166,390	\$ 35,885,319	\$ 46,399,528	\$ 65,654,476	\$ 87,072,106	\$ 91,200,678	\$ 81,034,431	\$ 61,546,543	\$ 67,256,236	\$ 62,925,966	\$ 61,290,230	\$ 766,038,002

REVENUES OF THE MUNICIPALITIES OF MEXICO FROM 1884 TO 1895.

REVENUES.

STATES.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	TOTAL.
Aguascalientes.....	\$ 60,147	\$ 55,176	\$ 58,989	\$ 59,106	\$ 60,033	\$ 68,260	\$ 71,735	\$ 75,434	\$ 78,128	\$ 64,179	\$ 71,597	\$ 73,140	\$ 797,944
Campeche.....	71,338	68,774	80,312	60,493	68,871	83,390	69,145	101,404	96,481	127,998	170,621	144,479	1,237,186
Coahuila.....	174,581	200,509	174,790	194,790	239,870	255,036	226,000	393,024	374,664	390,444	440,611	692,720	3,773,375
Colima.....	54,572	54,596	53,537	49,821	47,638	52,861	54,185	67,416	60,460	76,585	64,534	73,447	713,452
Chiapas.....	.....	.....	.....	.....	.....	.....	.....	61,096	82,398	103,450	120,103	143,004	510,051
Chihuahua.....	.....	.....	890,797	287,235	304,604	322,363	384,340	514,366	524,015	544,740	.....	.....	3,168,393
Durango.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Guajaluto.....	591,541	594,347	580,575	556,340	564,233	599,086	630,516	650,913	562,232	558,204	662,419	751,036	7,338,044
Guerrero.....	82,943	90,064	105,668	111,781	117,065	123,548	124,431	103,117	115,539	99,792	112,877	.....	1,201,935
Hidalgo.....	311,716	334,462	397,109	315,772	318,558	310,061	318,057	521,420	532,224	537,085	595,954	586,695	4,999,310
Jalisco.....	498,793	675,100	.....	.....	.....	.....	.....	427,616	476,120	531,353	490,635	518,265	3,586,869
México.....	176,996	210,500	233,671	245,392	246,687	260,793	252,090	254,934	266,677	276,048	290,686	291,911	3,016,776
Michoacan.....	.....	.....	226,264	235,349	250,174	245,197	256,335	295,700	306,677	346,488	379,043	401,070	2,693,069
Morelos.....	85,012	68,965	98,159	108,092	104,815	111,405	114,459	35,598	34,689	36,758	156,566	184,371	1,138,259
New Leon.....	156,773	155,761	160,614	180,819	194,739	240,438	253,544	343,994	330,758	377,011	418,749	433,566	3,247,846
Oaxaca.....	98,804	126,496	103,077	102,108	106,798	104,610	109,473	184,235	216,669	210,005	255,169	248,326	1,870,850
Puebla.....	894,686	945,462	.....	.....	.....	593,061	609,657	656,199	669,291	795,259	754,985	804,382	6,633,512
Queretaro.....	55,559	59,475	.....	.....	.....	.....	.....	77,041	70,918	65,351	70,387	80,736	472,437
San Luis Potosi.....	.....	.....	319,240	285,009	285,232	283,793	288,699	141,597	145,306	272,070	334,164	394,647	2,740,687
Sinaloa.....	.....	.....	397,067	410,575	481,194	495,429	516,366	476,714	470,688	477,745	437,543	473,958	4,599,279
Sonora.....	190,144	.....	209,316	216,782	212,855	248,216	241,986	220,400	269,958	277,479	.....	357,089	2,793,957
Tabasco.....	102,376	87,850	98,351	114,291	113,094	124,226	145,392	131,110	144,931	155,985	171,938	167,397	1,556,801
Tamaulipas.....	.....	.....	.....	.....	.....	.....	231,049	233,524	266,587	282,395	254,609	.....	1,335,064
Tlaxcala.....	30,615	40,013	40,013	37,302	47,756	43,568	35,470	47,662	50,084	46,565	51,118	48,298	595,598
Veracruz.....	890,442	890,442	1,828,202	2,222,601	2,222,601	2,348,601	2,183,907	2,688,724	2,764,251	2,788,308	3,571,222	24,439,837	24,439,837
Yucatan.....	140,388	176,854	156,277	209,040	198,411	233,390	159,812	248,678	249,090	261,214	302,015	293,551	2,628,680
Zacatecas.....	438,800	443,054	238,557	306,443	409,053	409,393	417,019	454,396	418,377	431,511	438,904	512,204	5,011,801
Territory of Lower California.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Territory of Tepic.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	\$3,204,108	\$5,586,792	\$5,857,057	\$6,702,049	\$6,728,675	\$7,691,787	\$7,881,022	\$9,368,881	\$9,760,610	\$10,108,656	\$10,883,004	\$7,903,600	\$93,997,201
Federal District.....	1,339,493	1,486,645	1,998,324	2,049,063	2,380,238	2,688,081	3,345,267	2,455,435	2,745,401	3,175,992	3,461,919	3,395,638	30,444,406
Total.....	\$4,606,511	\$7,073,437	\$7,786,281	\$8,751,112	\$9,108,913	\$10,379,868	\$11,226,289	\$11,824,316	\$12,506,011	\$13,284,648	\$14,345,013	\$11,299,238	\$124,351,607

Revenue and Expenses.

153

EXPENSES OF THE MUNICIPALITIES OF MEXICO FROM 1884 TO 1895.

STATES.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	TOTAL.
Aguascalientes.	\$ 60,537	\$ 55,022	\$ 38,080	\$ 50,106	\$ 62,053	\$ 68,260	\$ 71,375	\$ 75,677	\$ 70,232	\$ 64,734	\$ 71,760	\$ 73,272	\$ 781,226
Campeche.....	71,162	68,382	77,447	92,147	92,500	81,209	87,160	94,416	80,000	100,245	121,130	110,548	1,094,454
Coahuila.....	182,673	206,148	182,038	192,358	222,151	228,484	222,151	302,554	372,120	386,358	436,244	678,247	3,705,702
Colima.....	53,187	54,763	53,712	50,035	48,378	54,217	57,775	66,030	67,744	75,907	62,405	72,803	719,046
Chiapas.....	.....	.....	.....	.....	.....	.....	.....	60,109	81,712	105,886	115,551	139,738	593,070
Chihuahua.....	.....	.....	.....	.....	.....	.....	.....	502,605	511,012	532,422	.....	.....	3,137,368
Durango.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Guadalajara.....	594,545	595,280	101,033	108,757	114,481	120,205	122,090	101,036	120,768	571,115	654,363	732,607	5,577,468
Guerrero.....	82,422	87,432	307,051	310,708	318,200	307,885	318,056	306,200	470,207	517,572	574,876	562,334	4,858,766
Hidalgo.....	408,723	333,868	307,051	310,708	318,200	307,885	318,056	306,200	470,207	517,572	574,876	562,334	3,552,533
Jalisco.....	178,995	210,500	182,231	188,453	191,771	202,095	202,866	247,166	260,215	275,647	278,225	266,008	2,700,101
México.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morelos.....	84,985	68,586	224,068	232,162	232,055	243,785	250,370	271,690	287,405	317,662	352,712	360,371	2,782,140
New Leon.....	160,904	160,940	161,310	175,133	190,876	199,110	116,379	330,160	320,405	352,760	410,594	432,222	3,160,597
Oaxaca.....	114,973	113,632	90,998	92,455	93,239	94,570	106,537	170,902	202,516	207,045	236,266	234,490	1,762,473
Puebla.....	585,684	585,829	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5,868,763
Queretaro.....	551,320	501,807	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Luis Potosí.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sinaloa.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sonora.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tamaulipas.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tlaxcala.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Veracruz.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yucatán.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Zacatecas.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Territory of Lower Califor- nia.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Territory of Te- pic.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	\$4,013,354	\$5,166,953	\$5,161,014	\$5,896,886	\$5,081,741	\$7,570,001	\$7,804,792	\$9,443,363	\$9,851,388	\$9,298,338	\$10,587,578	\$7,667,955	\$90,016,393
Federal District.	1,332,451	1,491,055	1,882,825	2,082,296	2,391,464	2,658,093	3,239,074	2,580,074	3,210,371	3,042,865	3,460,845	3,378,695	30,728,320
Total.....	\$6,245,805	\$6,661,008	\$7,043,839	\$7,979,182	\$8,373,205	\$10,228,094	\$11,043,866	\$12,023,437	\$13,061,759	\$12,341,203	\$14,048,423	\$10,996,650	\$120,744,713

STATE AND MUNICIPAL FINANCES.

The best way in which I can give the state and municipal revenues and expenses in Mexico, is by inserting the detail amounts of the last twelve years of the revenues and expenses of each of the Mexican States, and a similar statement of the revenues and expenses of the municipalities of each State. That statement gives also the revenues and expenses of the City of Mexico, which have increased very considerably of late. In the year 1867, after the restoration of the Republic, they only amounted to about \$800,000, while in the year 1895, they had increased to \$3,395,638. (These statements are on pp. 150-153.)

FOREIGN TRADE.

The foreign trade of Mexico was necessarily very small before the railway era, because transportation was exceedingly high on account of the broken condition of the country, and only articles of great value and comparatively small weight could be profitably exported, while the price of foreign commodities became very high, both on account of transportation charges and high import duties. Therefore, only rich people could afford to consume foreign commodities, and the exports of Mexico were practically reduced to silver and gold, and to a few commodities having small bulk and great value.

The normal cost of transportation on merchandise from the City of Mexico to Veracruz, a distance of one hundred Mexican leagues or 263½ English miles, used to be, before the railroad connecting both places was built, \$68.75 per ton of 2200 pounds, or more than 26 cents per mile and ton; and in extraordinary circumstances, as during the French Intervention in Mexico from 1861 to 1867, the freight was as high as \$330 per ton, or over \$1.25 per mile and ton. Therefore, no article could be transported unless it was very much needed and it commanded a very high price. The result was that not only the foreign but also the domestic trade was reduced to its smallest proportions, and that the people raised just enough to provide for the wants of themselves and their immediate neighbors. A fact that may seem incredible is, that for the same reasons, among the farmers, a good crop was considered a great misfortune.

Since the railways have revolutionized transportation, our products, especially agricultural commodities, have begun to be sent to foreign markets, and their exportation is increasing considerably. As yet the precious metals, especially silver, are the main exports from Mexico, representing during the fiscal year ended June 30, 1896, 61 per cent. of our total annual exports; but other commodities are now exported, and they are in a fair way to exceed, before long, the value of our silver exports. I have no doubt that with the opening of our railroads, if our exports continue to increase in the same proportion as they have

recently done, Mexico will be able to supply the United States with most of the tropical products now consumed and not yet produced here, and even with others, that would find a market if they could be cheaply transported.

The same difficulties which prevented us from having correct accounts of our public revenues and expenses, and which I have stated in speaking on that subject, made it very difficult for many years to have correct statistics of our imports and exports.

Imports.—I could not give even a tentative statement, which I could vouchsafe, of our total imports and exports from 1821 to 1867, but the statement of the receipts of our custom-houses from 1823 to 1875, which appears on page 145 gives an approximate idea of our imports, considering that the receipts amount to about from 50 to 60 per cent. of the value of the imports.

I append a detailed statement of the imports and exports in Mexico during the years 1826, 1827, and 1828, and the total imports and exports during the year 1825.

From the fiscal year 1872–1873 our Statistical Bureau began to make its reports, and I have concised them in the three annexed statements comprising most of those years, up to the fiscal year ended June 30, 1896. The commodities are divided in their respective classes in accordance with the different schedules of the tariffs then in force.

MEXICAN IMPORTS AND EXPORTS FROM 1826 TO 1828.

MERCHANDISE.	1826.	1827.	1828.
<i>Imports.</i>			
Linen.....	\$2,384,715	\$2,180,191	\$1,711,051
Wool.....	934,295	493,760	245,901
Silk.....	1,432,578	844,732	398,003
Cotton.....	5,017,700	6,913,126	3,417,766
Mixed.....	122,968	107,108	38,654
Wines, liquors, groceries.....	2,888,066	2,867,320	3,244,498
Haberdashery.....	728,236	489,402	306,614
Medicines, drugs, and perfumeries.....	90,779	55,100	20,260
Books, blank and printed, paper.....	1,430,039	495,743	130,638
China, fine and ordinary, crystal and glass.....	264,424	311,074	332,819
Furniture, of wood and metal.....	91,910	103,047	57,187
Machines and instruments for mining, science, and the arts.....	63,499	22,816	44,123
Furs.....	912	4,517	318
Gold and silver.....	444	1,080	.....
Total imports.....	\$15,450,565	\$14,889,016	\$9,947,832
<i>Exports.</i>			
Gold and silver.....	\$5,847,795	\$9,669,428	\$12,387,288
Cochineal.....	1,356,730	912,049	1,483,746
Indigo, vanilla, jalap, and sarsaparilla.....	76,440	1,076,528	448,747
Other articles of indigenous products.....	367,164	513,769	169,005
Total exports.....	\$7,648,129	\$12,171,774	\$14,488,786
Total imports in 1825 : \$19,093,716.			
Total exports in 1825 : \$5,085,235.			

IMPORTS IN MEXICO FROM JULY 1, 1872, TO JUNE 30, 1875, AND IN THE YEAR 1884-1885.

	1872-1873.		1873-1874.		1874-1875.		1884-1885.	
	Invoice Value.	Duties.	Invoice Value.	Duties.	Invoice Value.	Duties.	Invoice Value.	Duties.
1. Cottons.....	\$7,036,913 45	\$4,992,003 53	\$8,814,123 34	\$6,002,759 46	\$7,379,339 12	\$5,826,530 86	\$6,153,559 86	\$5,234,420 08
2. Linens.....	1,003,595 70	603,559 96	1,173,572 41	700,445 22	703,052 21	496,896 20	548,191 22	469,798 70
3. Woollens.....	1,031,378 82	676,339 40	1,306,932 77	877,078 29	988,292 75	695,216 55	1,376,365 04	1,066,491 36
4. Silks.....	401,905 37	260,004 52	337,560 01	217,398 44	274,744 88	189,815 46	337,550 28	281,978 04
5. Mixtures.....	1,052,553 37	624,126 96	1,174,004 66	715,661 44	796,762 17	539,745 16	1,281,247 44	1,070,162 56
6. Groceries.....	3,613,162 45	2,184,375 85	3,334,152 92	2,058,713 20	2,955,852 55	2,038,344 16	3,761,080 40	2,632,185 86
7. Crystal.....	279,216 43	172,154 00	356,770 88	248,030 11	240,825 10	185,952 29	398,154 72	305,172 42
8. Haberdashery.	1,180,194 88	687,282 98	1,376,719 31	828,395 54	1,160,921 85	768,267 32	1,741,956 70	1,278,237 60
9. Chemicals....	178,258 75	141,181 29	226,681 92	198,761 67	174,618 02	143,569 70	479,734 38	348,709 22
10. Sundries.....	1,404,297 58	1,125,142 38	1,635,461 81	1,111,199 21	1,322,722 14	898,919 65	1,769,536 32	1,203,434 20
11. Commodities paying 55%..	555,027 91	366,946 65	36,400 00	23,352 84	58,444 09	38,276 14	296,166 38	194,302 24
Free Articles.....	2,499,508 14	.....	3,509,918 53	.....	2,737,918 73	.....	5,643,142 16	.....
Total.....	\$20,166,012 85	\$11,833,117 52	\$23,282,298 56	\$12,981,795 42	\$18,793,493 61	\$11,821,533 49	\$23,786,684 90	\$14,084,892 28

IMPORTS IN MEXICO FROM JULY 1, 1885, TO JUNE 30, 1886, AND FROM JULY 1, 1888, TO JUNE 30, 1890.

Foreign Trade.

157

1885-1886.		1888-1889.		1889-1890.		
UNDER THE TARIFF OF JANUARY 24, 1885.		UNDER THE TARIFF OF MARCH 1, 1887.				
	Invoice Value.	Duties.	Invoice Value.	Duties.	Invoice Value.	Duties.
1. Free of duties.....	\$2,682,343 26	.....	\$13,506,230 23	.....	\$21,238,598 91	.....
2. Cottons.....	5,520,538 32	\$6,953,659 28	7,534,088 70	\$7,447,394 70	7,677,131 31	\$8,109,445 45
3. Linens.....	556,115 48	639,234 50	674,029 52	671,590 87	681,879 69	645,276 72
4. Woolens.....	1,227,327 42	1,737,314 34	1,613,186 22	1,986,020 61	1,995,890 56	2,353,441 00
5. Silks.....	305,936 48	351,903 84	394,691 60	378,614 57	404,845 12	505,490 35
6. Mixtures.....	366,755 04	430,279 26	394,889 86	410,419 80	548,298 13	550,578 80
7. Food articles.....	2,390,360 48	2,037,829 30	4,893,706 49	3,789,270 57	5,954,813 02	4,627,227 87
8. Stones and earthenware.....	97,579 84	66,873 18	81,815 68	41,244 81	133,694 20	61,249 16
9. Crystal and porcelain.....	309,411 14	326,712 90	607,727 18	686,884 84	667,593 16	743,388 64
10. Gold, silver, and platinum.....	145,551 66	17,690 40	320,843 60	27,967 36	286,080 35	28,792 54
11. Iron and steel.....	852,065 14	674,270 34	1,510,129 91	1,259,480 12	2,024,625 21	1,507,561 26
12. Leather.....	363,577 72	238,771 08	593,166 91	324,225 37	705,768 54	428,993 02
13. Tin, lead, and zinc.....	42,620 20	34,558 16	75,968 92	39,289 76	93,421 20	50,877 98
14. Haberdashery.....	423,549 42	304,950 50	658,853 68	505,497 81	715,068 53	551,554 20
15. Machines.....	1,457,236 48	81,014 42	539,582 35	128,205 84	587,478 34	155,459 53
16. Carriages and wagons.....	75,024 30	41,868 66	213,796 20	116,206 57	272,264 46	150,161 03
17. Arms, ammunition, and gunpowder.....	285,926 12	141,862 40	280,453 04	172,830 78	348,652 13	200,487 78
18. Wood and its manufactures.....	202,492 52	171,495 12	473,684 25	368,523 72	620,984 55	480,905 30
19. Paper and its manufactures.....	951,677 28	626,525 02	1,352,143 12	1,161,250 81	1,359,417 23	1,154,445 55
20. Furs.....	253,677 12	197,113 18	414,109 54	290,211 92	506,693 83	348,989 86
21. Chemicals.....	736,656 94	496,131 56	1,607,830 38	997,449 42	1,737,395 37	1,036,988 80
22. Sundries.....	1,925,372 88	1,534,435 38	2,193,966 94	1,675,382 70	3,311,405 05	2,091,334 04
Total.....	\$21,171,795 24	\$17,104,492 82	\$40,024,894 32	\$22,477,962 95	\$32,018,658 89	\$25,782,648 88

IMPORTS IN MEXICO FROM THE FISCAL YEAR 1892-1893 TO THE FISCAL YEAR 1895-1896.

	FREE.					DUTYABLE.					TOTAL.				
	Invoice Value.					Invoice Value.					Invoice Value.				
	1892-1893.	1893-1894.	1894-1895.	1895-1896.		1892-1893.	1893-1894.	1894-1895.	1895-1896.		1892-1893.	1893-1894.	1894-1895.	1895-1896.	
1. Animal Industry:															
Live animals.....	\$ 9,049	\$ 10,797	\$ 3,640	\$ 7,452		\$ 745,321	\$ 260,010	\$ 160,673	\$ 734,555		\$ 714,363	\$ 270,807	\$ 173,313	\$ 381,097	
Animal manna.....	1,523	.....	.....	.....		370,441	302,880	597,301	707,409		597,301	302,880	597,301	707,409	
Animal products.....	12,220	11,022	13,370	26,271		1,243,263	817,868	780,436	1,054,732		1,245,553	820,466	820,466	1,054,732	
Animal manufactures.....	1,865	119	3,366	471		723,029	628,993	674,686	628,993		724,112	629,799	674,686	629,799	
Total.....	\$24,720	\$ 22,838	\$20,376	\$33,994		\$3,082,054	\$2,000,751	\$2,001,240	\$2,765,277		\$3,106,774	\$2,032,580	\$2,221,622	\$2,767,871	
2. Agricultural Products:															
Textiles.....	.....	.....	\$13,025	.....		\$ 2,365,756	\$2,016,616	\$2,341,747	\$1,761,488		\$ 2,365,756	\$2,016,616	\$2,341,747	\$1,761,488	
Fruits and grains.....	30,847	19,026	16,205	25,716		7,389,439	1,118,146	883,923	1,553,936		7,420,286	1,137,172	900,128	1,578,752	
Sundry vegetable substances.....	109,406	65,710	94,772	98,375		234,350	102,310	121,556	266,237		343,846	228,020	306,338	364,612	
Sundry vegetable products.....	3,583	3,437	9,578	3,137		1,208,458	1,019,067	974,778	1,194,787		1,212,041	1,023,404	984,356	1,197,024	
Wood and its products.....	937,383	675,950	600,512	966,411		341,752	276,838	296,430	391,658		1,279,135	952,788	896,742	1,358,669	
Manufactures of sundry vegetable substances.....	305,958	20	3,225	2,270		225,671	383,698	464,683	380,334		531,629	383,718	467,958	382,604	
Furniture.....	.....	.....	.....	.....		202,011	187,027	216,899	319,602		202,011	187,027	216,899	319,602	
Total.....	\$1,387,267	\$ 764,143	\$773,217	\$1,095,909		\$12,057,437	\$5,104,602	\$5,389,816	\$5,867,142		\$13,444,704	\$5,958,745	\$6,128,043	\$6,903,051	
3. Metals and its Manufactures:															
Gold, silver, and platinum.....	.....	.....	.....	.....		.....	.....	.....	.....		.....	.....	.....	.....
Copper.....	200,610	\$17,369	\$34,472	\$9,336		159,203	163,655	201,850	173,268		359,813	281,024	1,036,322	232,604	
Tin, lead, and zinc.....	31,183	24,479	24,670	55,683		497,092	438,503	600,916	676,098		599,175	462,082	625,586	731,781	
Iron and steel.....	4,228	3,148	6,115	4,495		69,042	73,377	102,514	128,030		73,270	76,525	108,620	133,425	
Other metals.....	1,216,596	441,254	285,165	1,040,435		1,855,228	2,054,929	2,427,516	3,140,837		3,077,824	2,466,183	2,713,681	4,190,272	
Stone and earthenware.....	603,525	506,643	541,664	574,153		824,131	124,131	3,281	4,470		604,500	1,714,774	544,945	578,623	
Crystal, glass, china, and porcelainware.....	1,804,477	1,051,373	1,040,790	1,046,402		826,979	614,256	675,167	982,678		2,631,256	1,665,620	1,714,977	2,029,080	
Total.....	6,472	6,039	2,851	6,853		545,297	594,073	548,230	867,162		551,769	511,012	551,081	874,015	
4. Fabrics:															
Cotton.....	\$1,866,891	\$2,151,205	\$2,775,727	\$2,796,357		\$3,054,725	\$3,860,924	\$4,559,494	\$5,973,443		\$7,821,616	\$6,012,129	\$7,295,221	\$8,760,800	
Linen.....	.....	.....	.....	.....		.....	.....	.....	.....		.....	.....	.....	.....
Wool.....	.....	.....	.....	.....		.....	.....	.....	.....		.....	.....	.....	.....
Silk.....	\$1,133	\$4,530	\$5,268	\$6,053		1,368,120	1,459,060	1,734,418	1,370,260		1,370,260	1,459,060	1,734,418	1,828,491	
Silk with a mixture of other substances.....	4,029	.....	.....	.....		428,372	393,334	456,681	554,382		432,401	397,864	461,949	560,435	
Total.....	\$6,160	\$4,530	\$5,268	\$6,053		\$6,854,297	\$6,933,610	\$7,783,945	\$9,420,950		\$6,860,459	\$6,938,140	\$7,783,213	\$9,420,103	
5. Chemicals, oils, and paints:															
Wines, liquors, fermented and unfermented drinks.....	146,059	.....	.....	.....		897,687	1,009,350	1,276,620	1,723,545		1,044,246	1,009,350	1,276,620	1,723,545	
Paper and its manufactures.....	156,953	143,557	172,228	217,359		2,734,164	1,913,161	2,174,460	2,530,249		2,734,164	1,913,161	2,174,460	2,530,249	
Machinery.....	1,935,081	146,047	157,892	260,224		1,317,822	3,399,331	3,574,507	4,042,920		1,370,260	3,574,507	4,042,920	4,524,378	
Carriages.....	625,324	162,312	141,977	58,050		308,095	151,891	137,538	137,538		933,403	314,203	279,515	811,461	
Arms and Explosives.....	444,182	.....	.....	.....		522,684	606,114	853,601	1,018,461		966,866	606,114	853,601	1,018,461	
Sundries.....	8,062	1,058	979	5,587		879,625	798,201	909,000	1,109,109		887,687	799,259	909,079	1,114,666	
Grand Total.....	\$8,604,301	\$3,395,690	\$3,972,694	\$5,004,533		\$34,811,830	\$26,891,793	\$30,027,736	\$37,012,209		\$43,413,131	\$30,287,483	\$34,000,440	\$42,016,742	

I append a statement which shows the imports and exports of Mexico during the two fiscal years 1894-1895 and 1895-1896, both by countries and by custom-houses, and the imports and duties by countries in the fiscal years 1888-1889 and 1889-1890.

Exports.—It would be difficult to make a correct statement of our exports previous to the fiscal year 1867-1868. Their amount was very small for reasons already given, and as they principally consisted in silver, and almost all the silver coined was exported the coinage of which we have exact records, can be taken as the amount of exports, with the addition of from 30 to 40 per cent., representing the silver both in coin and bullion smuggled. I give a correct statement of our exports of agricultural commodities from the fiscal year 1877-1878 to 1895-1896, and also a statement of our exports of other commodities from the fiscal year 1886-1887 to 1895-1896, which shows the rapid pace at which they are increasing.

The exports from Mexico are embraced in the following articles :

MINERALS.	ANIMAL PRODUCTS.	FRUITS.
Chapopote.	Bones.	Bananas.
Coal.	Cattle.	Cocoanuts.
Copper in bars.	Chihuahua terriers.	Lemons.
Gold and silver coin.	Donkeys.	Limes.
Gold and silver bullion.	Goats.	Oranges.
Lead in pigs.	Hair, horse.	Pine apples.
Onyx.	Hair, rabbit.	Walnuts, Nuevo Leon.
Opals.	Heron feathers.	Tamarind pulp.
Ores of silver, copper, and lead.	Hides, raw and tanned.	
	Hoofs.	
	Horns.	
AGRICULTURAL PRODUCTS.	Horses.	FORESTRY.
Beans.	Mules.	Cabinet woods, mahogany, moral, lind-aloe, tepeguaje, cedar, sandal, ebony, and rosewood.
Bitter almonds and various fruits, kernels.	Ox grease.	Dye woods, brasil, camphor, moral, and other varieties of logwood.
Chick-peas.	Sheep.	Orchilla.
Cocoa.	Skins of sheep and goat, dressed and undressed.	
Coffee.	MANUFACTURES.	
Honey.	Cotton, linen, worsted and silk domestic shawls (rebzos).	SUNDRIES.
India-rubber.	Guadalajara earthenware.	Copal, chick, and sundry resinous substances.
Molasses.	Magney, brandy (Tequila) and mescal.	Jalap, and other medicinal herbs.
Piloncillo (brown sugar).	Preserved sweet meats.	Mother of pearl shells.
Sugar, all grades.	Rag puppets and dolls.	Pearls.
	Rags (all sorts).	Tortoise shell from the Gulf of Cortez.
FIBRES.	Wax, artificial flowers and figures.	Vanilla.
Henequen.	Woollen and worsted Mexican plaids or blankets (Zarapes).	Zacaton brush and broom grasses.
Ixtle.		
Mallows fibre.		
Pita.		
Ramie.		
Sotol.		
Wool.		

IMPORTS IN MEXICO BY COUNTRIES IN THE FISCAL YEARS 1888-1889 AND 1889-1890 AND IMPORTS AND EXPORTS BY COUNTRIES AND CUSTOM HOUSES IN THE FISCAL YEARS 1894-1895 AND 1895-1896.

COUNTRIES	1888-1889.				1889-1890.				FISCAL YEAR.			
	DUTIES.		DUTIES.		DUTIES.		DUTIES.		1894-95.		1895-96.	
	VALUE.	\$	VALUE.	\$	VALUE.	\$	VALUE.	\$	IMPORTS.	EXPORTS.	IMPORTS.	EXPORTS.
Arabia.....	82	\$	24	\$	19	\$	8	\$	417	.....	10,434	.....
Argentina.....	13,640	15,097	15,097	14,146	5,358	.....	.....	.....	.....	.....	.....	.....
Argentine Re- public.....	30	32	32	600	177	.....	.....	.....	.....	.....	.....	.....
Australia.....	485	216	216	3,895	77	.....	.....	.....	.....	.....	.....	.....
Austria.....	96,436	74,814	74,814	117,544	87,615	.....	.....	.....	.....	.....	.....	.....
Bavaria.....	.....	.....	.....	400	.....	.....	.....	.....	.....	.....	.....	.....
Belgium.....	242,083	232,287	232,287	553,270	281,198	.....	.....	.....	.....	.....	.....	.....
Bolivia.....	600	277	277	.....	1,949	.....	.....	.....	.....	.....	.....	.....
Brazil.....	399	330	330	912	.....	.....	.....	.....	.....	.....	.....	.....
Canada.....	108	.....	.....	220	.....	.....	.....	.....	.....	.....	.....	.....
Chile.....	30,351	26,346	26,346	59,001	45,682	.....	.....	.....	.....	.....	.....	.....
China.....	78,178	32,255	32,255	58,666	71,773	.....	.....	.....	.....	.....	.....	.....
Colombia.....	24,425	6,360	6,360	24,742	6,246	.....	.....	.....	.....	.....	.....	.....
Costa Rica.....	.....	.....	.....	1,808	.....	.....	.....	.....	.....	.....	.....	.....
Cuba.....	.....	.....	.....	1,808	.....	.....	.....	.....	.....	.....	.....	.....
Denmark.....	1,112	729	729	1,808	.....	.....	.....	.....	.....	.....	.....	.....
Ecuador.....	89,451	38,449	38,449	118,477	55,156	.....	.....	.....	.....	.....	.....	.....
Egypt.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
England.....	6,337,080	5,083,870	5,083,870	8,535,370	6,259,303	.....	.....	.....	.....	.....	.....	.....
France.....	4,956,568	3,846,452	3,846,452	6,253,998	4,864,032	.....	.....	.....	.....	.....	.....	.....
Germany.....	2,844,932	2,310,015	2,310,015	3,676,684	2,368,077	.....	.....	.....	.....	.....	.....	.....
Greece.....	1,689	402	402	468	.....	.....	.....	.....	.....	.....	.....	.....
Guatemala.....	11,548	3,636	3,636	11,448	.....	.....	.....	.....	.....	.....	.....	.....
Holland.....	72,009	53,010	53,010	160,535	129,319	.....	.....	.....	.....	.....	.....	.....
Honduras.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
India.....	69,629	123,302	123,302	85,490	144,032	.....	.....	.....	.....	.....	.....	.....
Italy.....	269,826	121,818	121,818	101,505	58,119	.....	.....	.....	.....	.....	.....	.....
Japan.....	95	64	64	1,515	.....	.....	.....	.....	.....	.....	.....	.....
Morocco.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nicaragua.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norway.....	3,176	33,358	33,358	44,462	34,397	.....	.....	.....	.....	.....	.....	.....
Persia.....	102	73	73	360	444	.....	.....	.....	.....	.....	.....	.....
Peru.....	772	347	347	122	30	.....	.....	.....	.....	.....	.....	.....
Portugal.....	9,132	2,656	2,656	13,311	4,738	.....	.....	.....	.....	.....	.....	.....
Russia.....	833	386	386	363	104	.....	.....	.....	.....	.....	.....	.....
Salvador.....	11,315	4,664	4,664	3,465	890	.....	.....	.....	.....	.....	.....	.....
San Domingo.....	80	60	60	150	94	.....	.....	.....	.....	.....	.....	.....
Senegambia.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spain.....	1,920,942	1,177,177	1,177,177	2,576,289	1,529,561	.....	.....	.....	.....	.....	.....	.....
Sweden.....	2,905	1,007	1,007	4,845	6,005	.....	.....	.....	.....	.....	.....	.....
Switzerland.....	157,444	89,830	89,830	238,163	125,579	.....	.....	.....	.....	.....	.....	.....
Turkey.....	2,327	761	761	1,205	452	.....	.....	.....	.....	.....	.....	.....
United States.....	22,669,420	9,169,787	9,169,787	20,080,276	9,564,446	.....	.....	.....	.....	.....	.....	.....
Uruguay.....	2	10	10	.....	728	.....	.....	.....	.....	.....	.....	.....
Venezuela.....	75,738	25,435	25,435	37,819	14,207	.....	.....	.....	.....	.....	.....	.....
Zanzibar.....	20	37	37	80	211	.....	.....	.....	.....	.....	.....	.....
Total.....	\$40,021,385	\$22,477,043	\$22,477,043	\$52,018,648	\$25,782,639	\$34,000,440	\$42,253,938	\$105,016,902	\$34,000,440	\$90,854,953	\$12,253,938	\$5,016,902

Foreign Trade.

161

The following is a list of the value of metals and commodities exported from Mexico during the fiscal year 1895-1896, which shows that they are all either mineral or agricultural products, these being only raw materials: The commodities are placed in the order of their relative importance in value.

METALS.

Gold ore.....	\$160,555	
Gold coin.....	169,794	
Gold bullion.....	20,377,663	
Silver ore.....	10,885,479	
Silver coin.....	5,246,418	
Silver bullion.....	26,345,160	
Sulphate of silver.....	1,030,156	
Foreign gold and silver and silver in other combinations.....	623,371	
Total.....		\$64,838,596

COMMODITIES.

Coffee.....	\$8,103,302	
Henequen.....	6,763,821	
Cabinet and dye woods.....	4,206,880	
Copper.....	3,909,485	
Lead.....	2,531,624	
Live animals.....	3,546,770	
Hides and skins.....	2,331,999	
Chewing gum.....	1,527,838	
Tobacco.....	1,461,090	
Vanilla.....	1,428,675	
Ixtle.....	690,862	
Zacaton—broom root.....	616,492	
Chick-peas.....	352,737	
Coal.....	270,176	
Marble.....	258,668	
Fruits.....	246,150	
Sugar.....	169,662	
Horse hair, beans, and jalap.....	247,768	
All others.....	1,514,307	
Total.....		40,178,306
		<u>\$105,016,902</u>

VOL. I—11

EXPORTS OF MEXICAN COMMODITIES DURING THE TEN FISCAL YEARS, FROM JULY 1, 1886, TO
JUNE 30, 1896.

FISCAL YEARS.	LIVE STOCK.		COCOA.		HIDES AND SKINS.		FRUITS.		WOOL. (raw.)		TOTAL VALUE of exports of domestic produce (not metals).
	Heads.	Value.	Weight, Kilo- grams.	Value.	Weight, Kilo- grams.	Value.	Weight, Kilo- grams.	Value.	Weight, Kilo- grams.	Value.	
1886-1887.....	100,467	\$ 470,007	663	\$ 425	6,308,800	\$2,211,439	1,099,078	\$ 74,815	873,051	\$169,324	\$ 2,026,100
1887-1888.....	100,221	506,997	659	397	5,109,243	1,864,471	1,706,076	51,045	50,483	12,518	2,436,328
1888-1889.....	84,257	585,894	197	231	4,957,043	2,011,128	1,551,595	53,612	36,013	90,507	2,741,432
1889-1890.....	91,913	493,223	7,666	3,633	4,743,326	1,013,129	1,566,515	68,581	124,050	20,826	2,505,302
1890-1891.....	30,331	182,690	149	93	4,571,830	1,804,829	2,705,369	103,850	49	30	2,091,422
Totals in five years.....	413,189	\$2,238,831	9,334	\$4,779	25,690,262	\$9,804,996	9,948,739	\$352,803	1,419,446	\$299,265	\$12,700,674
Averages per annum....	82,638	\$447,766	1,867	\$956	5,138,052	\$1,960,999	1,986,748	\$70,561	283,889	\$59,853	\$2,540,135
1891-1892.....	7,932	\$ 56,589	.....	.....	5,335,971	\$1,031,701	2,524,239	\$105,395	126	\$ 56	\$ 2,003,831
1892-1893.....	168,164	1,741,161	639	639	5,666,320	2,067,156	2,475,873	104,042	38,648	8,881	3,021,879
1893-1894.....	19,054	144,122	1,901	1,903	5,619,227	2,256,160	2,842,523	136,147	68	15	2,541,727
1894-1895.....	7,723	137,382	83,877	42,809	4,030,209	2,350,462	2,011,688	125,460	58,759	11,252	2,667,165
1895-1896.....	266,838	3,543,549	2,774	2,543	3,099,841	2,422,099	6,488,921	246,150	41,376	5,851	6,220,192
Totals in five years.....	469,711	\$5,622,803	88,791	\$47,974	25,490,568	\$11,027,768	17,747,244	\$720,194	138,077	\$26,055	\$17,444,794
Averages per annum....	93,942	\$1,124,560	17,758	\$9,595	5,098,113	\$2,205,554	3,440,448	\$144,039	27,795	\$5,211	\$3,486,959
Totals in ten years.....	882,900	\$7,861,634	98,125	\$52,753	51,180,830	\$20,832,764	27,195,983	\$1,072,977	1,558,483	\$325,320	\$20,145,468
Averages per annum....	88,290	\$786,163	9,812	\$5,275	5,118,083	\$2,083,276	2,719,598	\$107,290	155,842	\$32,532	\$3,014,547

EXPORTS OF MEXICAN COMMODITIES DURING THE TEN FISCAL YEARS, FROM JULY 1, 1886, TO
JUNE 30, 1896—(Continued).

FISCAL YEARS.	CABINET WOODS.		DYE WOODS.		COAL.		OTHER ARTICLES (not metals) exported. Value.	TOTAL VALUE of exports of domestic products. (not metals).
	Weight, Kilo- grams.	Value.	Weight, Kilo- grams.	Value.	Weight, Kilo- grams.	Value.		
1886-1887.....	66,790,669	\$ 974,239	48,166,637	\$ 860,802	.....	.....	\$10,860,786	\$12,705,397
1887-1888.....	46,092,480	660,322	44,044,581	773,671	402,243	\$ 2,177	13,668,223	15,443,393
1888-1889.....	39,678,762	604,609	36,551,200	684,592	83,552,558	350,171	16,098,344	17,931,716
1889-1890.....	45,090,669	803,009	44,934,537	921,728	45,140,062	188,597	19,457,462	21,372,706
1890-1891.....	53,044,251	997,973	39,981,205	811,624	39,482,132	160,702	23,049,002	24,998,601
Totals in five years.....	251,436,881	\$4,350,952	214,593,169	\$4,061,417	168,586,895	\$701,557	\$83,967,817	\$93,081,743
Averages per annum.....	50,287,376	\$870,190	42,919,034	\$812,283	33,777,379	\$140,311	\$16,793,563	\$18,616,340
1891-1892.....	53,536,153	\$ 882,658	39,180,385	\$ 767,217	55,969,021	\$211,154	\$ 22,565,351	\$ 24,236,980
1892-1893.....	44,266,557	746,717	44,133,509	916,312	8,479,688	33,960	26,931,447	28,680,656
1893-1894.....	44,796,731	673,566	81,233,004	1,396,576	46,796,184	205,605	26,045,190	30,333,040
1894-1895.....	118,667	631,143	81,694,951	2,056,030	53,102,201	232,919	31,128,083	34,048,155
1895-1896.....	56,271	671,678	110,336,715	2,912,476	66,174,597	270,176	29,863,784	33,958,114
Totals in five years.....	144,742,879	\$3,905,756	336,482,464	\$8,051,811	233,345,931	\$65,814	\$138,326,044	\$151,247,425
Averages per annum.....	28,948,576	\$781,151	67,296,493	\$1,610,362	46,669,186	\$192,763	\$27,665,209	\$30,249,485
Totals in ten years.....	396,179,760	\$8,256,708	551,077,633	\$12,113,228	401,932,826	\$1,665,371	\$222,293,861	\$244,359,168
Averages per annum.....	39,617,976	\$825,671	55,107,763	\$1,211,323	40,193,283	\$166,537	\$22,229,386	\$24,432,917

STATEMENT OF EXPORTS OF SOME AGRICULTURAL PRODUCTS DURING THE FISCAL YEARS FROM JULY 1, 1877, TO JUNE 30, 1896.

FISCAL YEARS.	ORCHILLA.		HENNEQUEN.		ITILE.		COFFEE.		TOBACCO.		TOTAL VALUE OF EXPORTS.	
	Weight in Kilograms.	Value in Mexican Currency.	Weight in Kilograms.	Value in Mexican Currency.	Weight in Kilograms.	Value in Mexican Currency.	Weight in Kilograms.	Value in Mexican Currency.	Weight in Kilograms.	Value in Mexican Currency.	Successive Annual Increase per ct.	
1877-1878.....	3,804,343	\$ 228,146	11,360,180	\$ 1,076,076	2,167,236	\$ 257,768	4,867,779	\$ 1,242,041	111,211	\$ 86,713	.....	\$ 2,804,744
1878-1879.....	2,211,203	152,670	13,442,489	1,267,375	1,668,305	101,287	8,654,494	2,230,007	128,098	120,532	+37.723	3,083,970
1879-1880.....	900,647	54,581	20,574,513	1,945,375	2,454,600	101,076	7,656,267	1,984,473	398,102	310,146	+15.123	4,686,483
1880-1881.....	2,151,240	153,315	24,161,197	2,285,369	3,432,676	128,278	8,706,827	2,243,782	371,674	371,188	+16.069	5,384,438
1881-1882.....	1,582,600	115,618	26,182,071	2,672,107	4,748,970	680,109	10,447,805	2,414,538	351,253	351,253	+15.931	6,172,715
Av'ge in 5 years..	1,752,206	113,268	19,149,800	1,849,651	2,882,359	\$ 353,902	8,066,634	\$ 2,022,086	304,214	\$ 252,464	+21.216	\$ 4,592,270
1882-1883.....	1,180,430	74,690	30,069,409	3,311,063	5,153,095	\$ 592,533	8,556,809	\$ 1,717,191	965,481	\$ 272,160	-3.274	\$ 5,071,576
1883-1884.....	809,480	75,053	45,538,972	4,165,020	2,523,580	434,431	6,917,720	1,570,021	402,100	297,070	+0.870	6,561,498
1884-1885.....	506,097	72,772	46,173,570	3,988,790	6,100,490	672,583	5,821,276	1,201,673	365,686	412,013	+3.227	6,240,731
1885-1886.....	980,070	71,870	40,802,803	3,990,116	6,046,122	523,072	8,385,641	1,699,724	528,168	528,168	-0.304	5,712,280
1886-1887.....	1,311,763	116,891	39,536,048	3,991,621	3,881,621	348,842	8,326,215	2,697,477	824,420	824,420	+34.368	7,143,645
Av'ge in 5 years..	979,358	82,443	40,364,841	3,659,123	4,958,959	\$ 575,272	7,602,150	\$ 1,765,017	480,339	\$ 474,484	+5.670	\$ 6,495,339
1889-1890.....	1,140,009	106,201	36,754,047	6,229,460	3,570,628	\$ 361,687	6,528,086	\$ 2,431,025	764,131	\$ 820,262	+26.008	\$ 9,956,825
1890-1891.....	1,446,622	124,530	38,594,670	6,972,593	5,454,944	544,118	6,463,021	3,886,034	900,960	971,886	+23.907	12,337,107
1891-1892.....	1,312,350	114,797	59,371,714	7,392,445	7,145,770	827,181	10,626,042	4,821,000	1,214,745	1,214,745	+14.243	14,094,335
1892-1893.....	17,037	1,331	53,731,076	7,092,557	7,076,970	673,350	14,656,777	6,150,359	1,041,922	1,041,922	+7.324	15,129,004
1893-1894.....	17,022	985	50,337,719	6,358,220	6,070,501	617,300	11,056,279	5,574,335	1,360,010	1,760,928	-5.891	14,937,788
Av'ge in 5 years..	599,566	47,102	44,918,618	6,782,215	6,148,576	\$ 644,827	10,209,175	\$ 4,558,554	1,070,282	\$ 1,100,591	+13.302	\$ 13,151,040
1894-1895.....	319,751	16,637	60,424,057	8,893,071	6,327,570	\$ 588,487	14,574,049	\$ 8,727,119	1,321,368	\$ 1,459,690	+38.258	\$ 19,685,024
1895-1896.....	540,330	14,019	50,625,051	6,718,667	5,667,444	461,614	12,766,000	11,766,000	1,735,314	1,735,314	+5.235	\$ 20,715,704
1896-1897.....	382,905	11,300	67,157,018	4,342,621	4,342,621	340,537	16,512,463	12,670,762	1,310,902	1,460,133	+7.224	\$ 22,215,615
Av'ge in 4 years..	413,207	13,086	59,342,058	6,768,027	7,154,845	\$ 694,192	11,493,558	\$ 8,103,302	1,333,109	\$ 1,461,090	+23.508	\$ 27,037,069
Total for 19 years	77,958,485	\$1,266,838	795,715,506	\$91,548,783	93,441,931	\$9,664,865	191,197,543	\$83,000,084	15,299,916	\$15,373,918	.....	\$200,852,508
Av'ge in 19 years.	945,183	\$66,677	40,300,816	\$4,818,357	4,917,996	\$508,677	10,063,028	\$4,368,426	804,890	\$809,153	.....	\$10,371,184

REMARKS.—The records regarding the Exports to which this statement refers, before the year 1877-1878 are not reliable.

The increase of the average yearly amount of exports, on the second period of five years of this statement was 41.402 per cent. as compared with the average of the first period.

The grand total amount of the Exports of the five articles of domestic production specified in this statement was seventy times as much as the amount of the first year 1877-1878.

The average yearly successive increase of the Exports herein specified, was 10.852 per cent.

In regard to the decrease of something more than 23 per cent. in the amount of exports registered in the fiscal year 1895-1896, it may be stated that while there was undoubtedly a shortness in the coffee-harvest, the increase of home consumption, and consequent raise of the price of the article was the main factor for the said decrease of export.

In proportion to the total amount of Exports, herein specified, that of each of the five articles, was as follows: *Hennequen*, 45.580 per cent. *Coffee*, 41.324 per cent. *Tobacco*, 7.654 per cent. *Jazite*, 4.812 per cent., and *Orchilla*, 0.631 per cent.

VALUE OF IMPORTS FROM MEXICO FROM JULY 1, 1882, TO JUNE 30, 1892.

PRECIOUS AND OTHER METALS.

NOMENCLATURE.	1883-1884.	1884-1885.	1885-1886.	1886-1887.	1887-1888.	1888-1889.	1889-1890.	1890-1891.	1891-1892.
Argentiferous copper.....	\$ 235 00	\$ 187 00	\$ 25,197 00	\$ 3,044 24	\$ 51,772 00	\$ 19,788 71	\$ 1,810 00	\$ 1,382 00	\$ 317,242 75
Argentiferous lead.....	5,200 00	8,656 40	5,150 00	5,400 00	8,102 00	11,957 60	1,810 00	1,382 00	1,457,878 32
Base silver.....	2,000 00	2,016 00	3,450 00	5,400 00	11,772 00	25,496 00	1,810 00	1,382 00	3,900 00
Gold foreign coin.....	22,047 00	14,457 00	55,674 38	35,890 87	21,578 85	34,547 24	13,204 00	20,594 00	33,684 00
Gold in lingots.....	696,658 97	490,439 81	200,590 60	282,486 09	347,547 24	340,597 53	457,610 59	612,619 12	751,408 18
Gold Mexican coin.....	200,816 25	391,097 45	316,938 57	198,758 75	238,104 00	233,255 00	96,592 00	134,219 00	175,524 00
Gold ore.....	20,823 99	520 00	56,892 27	395,581 37	52,833 83	154,347 08	141,022 70	229,806 85	97,885 00
Silver foreign coin.....	205,995 75	97,821 50	50,142,237 26	5,268,773 66	6,904,157 23	6,600,202 75	7,959,938 68	6,751,210 07	6,559,670 36
Silver in lingots.....	5,312,110 40	5,881,178 00	21,060,927 88	21,425,173 85	16,814,117 26	23,682,337 29	23,484,480 40	17,622,171 10	26,428,376 00
Silver Mexican coin.....	25,994,713 68	25,394,262 02	21,060,927 88	21,425,173 85	16,814,117 26	23,682,337 29	23,484,480 40	17,622,171 10	26,428,376 00
Silver mixed with gold.....	18,118 08	18,118 08	247,261 62	337,862 70	5,028,903 97	7,663,589 07	6,394,660 41	8,674,457 24	1,294,487 14
Silver ore.....	698,354 98	1,322,806 91	1,802,836 84	3,171,862 70	5,028,903 97	7,663,589 07	6,394,660 41	8,674,457 24	10,472,003 92
Sulphate of silver.....	99,622 19	14,430 37	116,022 70	815,506 68	627,799 51	799,550 64	853,958 58	1,280,768 97	1,458,095 37
Total.....	\$29,628,657 69	\$33,774,050 92	\$29,906,400 84	\$33,560,502 56	\$31,006,187 71	\$38,785,274 99	\$38,621,290 23	\$36,256,372 16	\$49,137,303 98

COMMODITIES.

Ale.....	\$ 1,468 95	\$ 940 38	\$ 691 06	\$ 1,122 00	\$ 3,510 25	\$ 3,088 56	\$ 31,332 50	\$ 29,080 03	\$ 22,413 45
Brandy.....	3,650 00	760 00	70,436 03	247,348 82	12,434 65	4,117 00	9,316 37	14,323 50	5,097 50
Coal.....	1,717,190 85	1,579,020 83	1,201,673 38	1,609,723 82	2,627,477 11	3,886,034 53	4,811,000 48	6,150,358 72	5,514,355 15
Coffee.....	1,430 00	365 25	5,724 00	4,008 00	6,336 00	5,313 00	12,275 00	18,769 50	7,653 00
Cotton.....	181 00	800 13	4,405 00	10,139 04	18,160 00	2,444 00	1,247 50	66 00	1,180 00
Fresh and salted meats.....	62,007 77	70,794 76	67,681 30	71,133 38	55,401 80	58,884 82	64,207 13	58,477 92	69,410 05
Horse hair.....	159,882 72	202,406 09	66,367 73	108,488 18	179,590 51	124,547 27	72,558 02	72,558 02	47,584 32
India-rubber.....	630 50	45,855 00	30,156 25	110,086 50	62,862 40	11,087 50	85,305 37	93,143 88	7,079 00
Indigo.....	7,650 00	4,809 85	3,055 00	6,129 00	9,709 00	20,013 00	6,850 00	17,574 00	27,514 26
Jewels and precious stones.....	624,376 18	620,936 05	406,456 04	622,006 52	471,470 80	587,063 00	500,217 25	184,222 00	59,335 20
Live animals.....	125 00	125 00	3,014 00	2,025 00	120 00	758 00	2,225 00	20,368 40	33,352 87
Oils.....	3 50	3,080 00	34,871 26	178,887 00	107,276 98	40,880 36	61,983 80	24,018 40	21,888 59
Rice.....	198,365 16	177,260 11	34,871 26	178,887 00	107,276 98	40,880 36	61,983 80	24,018 40	21,888 59
Sarc.....	2,786,836 63	2,716,122 45	1,985,632 85	3,068,971 26	3,532,479 76	5,126,349 64	5,882,944 15	6,838,364 62	6,028,067 91
Sugar.....	2,786,836 63	2,716,122 45	1,985,632 85	3,068,971 26	3,532,479 76	5,126,349 64	5,882,944 15	6,838,364 62	6,028,067 91
Carried forward.....									

Statistical Notes on Mexico.

COMMODITIES—(Continued).

NOMENCLATURE.	1882-1883.	1883-1884.	1884-1885.	1885-1886.	1886-1887.	1887-1888.	1888-1889.	1889-1890.	1890-1891.	1891-1892.
Brought forward.....										
Bones.....	\$ 2,765,836 61	\$ 2,716,122 45	\$ 1,981,628 85	\$ 3,068,971 26	\$ 3,568,977 76	\$ 3,532,479 76	\$ 5,146,349 64	\$ 5,882,944 15	\$ 6,838,364 66	\$ 6,058,067 91
Brown sugar.....	3,430 75	4,650 04	5,090 06	22,897 72	6,384 00	2,400 00	6,700 00	3,874 25	6,982 00	8,872 00
Chapapote.....	32,132 17	11,767 08	3,662 59	29,188 13	17,321 15	39,997 44	3,880 25	12,516 30	29,202 58	41,616 10
Chewing gum.....	652 59	1,570 08	1,008 97	1,662 80	6,286 44	3,371 80	3,597 50	97,245 21	1,835 00	9,043 10
Chick peas.....	84,902 38	124,537 61	68,809 66	158,152 86	357,413 22	375,816 61	593,626 26	716,746 33	1,466,927 10	723,571 95
Copper.....	48,852 44	19,715 00	4,097 33	11,611 75	38,558 80	375,182 80	27,797 00	98,141 00	98,311 00	283,251 73
Copper ore.....	65,950 00	39,597 00	16,097 67	21,330 75	37,560 13	615,666 00	811,080 18	735,183 00	940,090 00	866,328 04
Corn.....	63,684 11	5,488 88	25,800 00	7,655 54	18,609 99	25,880 07	13,771 03	1,857 00	8,108 80	8,027 55
Documents.....	19,483 00	12,428 00	14,005 41	19,380 75	13,543 00	12,333 00	24,912 75	11,535 00	6,464 00	9,634 00
Equipages.....	18,800 00	40,870 00	36,750 00	9,351 75	18,073 00	5,897 66	2,470 00	88,005 00	2,415 00	19,060 00
Essence of aloes.....	78,598 44	78,936 59	74,928 38	73,048 08	74,814 99	51,945 00	33,000 00	88,770 00	17,300 00	19,500 00
Fine pearls.....	.....	1,533 84	.....	23,800 00	49,111 00	68,024 14	35,829 30	28,085 00	103,849 02	105,395 28
Guanito.....	3,311,602 64	4,105,080 35	3,988,790 97	2,999,110 90	3,091,688 19	6,299,439 62	6,974,592 87	7,392,144 69	7,048,536 76	29,000 00
Honey.....	115,817 90	106,402 90	123,547 70	59,455 84	44,049 00	50,435 42	61,769 10	103,866 40	91,874 92	6,350,480 13
Indigo.....	596,533 23	434,430 94	672,583 34	523,972 47	348,841 00	361,687 28	594,118 55	827,960 61	823,349 84	179,728 08
Lard.....	580 00	1,705 00	.....	.....	.....	.....	380 00	141 00	31 88	617,300 22
Lemons.....	745 90	877 46	1,560 50	3,283 00	8,307 45	63,079 75	54,099 00	79,768 90	70,675 00	10,575 90
Lima beans.....	90,641 11	75,518 91	68,486 00	43,503 74	79,069 82	120,839 84	151,145 99	79,639 90	208,500 38	43,280 04
Manufactures.....	7,059 40	16,430 70	13,672 07	11,068 07	12,386 01	18,902 53	14,811 32	15,402 65	13,966 74	127,552 25
Manufactures returned.....	13,655 00	24,334 88	81,972 00	48,953 75	121,953 60	44,067 50	50,398 23	178,435 40	97,154 69	12,413 17
Marble.....	8,014 00	4,095 00	14,369 25	8,196 21	15,314 75	35,917 14	51,530 25	102,134 86	87,555 85	90,748 00
Orchilla.....	74,628 68	75,053 20	73,772 50	71,870 30	116,890 86	106,290 52	12,535 00	124,796 08	1,331 00	106,654 50
Paper.....	8,172 66	5,396 33	3,977 00	10,040 07	9,553 08	11,149 36	12,886 73	10,919 44	22,051 75	90,245 90
Printed books.....	1,569 88	3,301 00	3,987 50	3,690 00	5,822 81	7,407 30	11,710 80	15,728 20	3,681 00	5,176 00
Samples.....	.....	999 68	999 68	3,080 00	1,731 38	2,734 98	98,059 28	62,557 90	9,745 90	27,553 00
Skins.....	1,653,165 92	1,779,957 14	1,779,957 14	2,133,559 70	2,211,438 34	1,864,469 48	2,011,128 85	1,913,129 05	1,804,868 69	1,931,791 18
Tanning wood.....	6 21	.....	.....	.....	39,683 28	35,078 36	10,532 50	14,484 00	22,160 00	8,802 00
Tin.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11,600 00
Tin ore.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	14,040 68
Tortoise shell.....	48,420 44	50,435 54	67,663 85	20,198 88	6,836 00	19,993 50	32,643 45	30,258 74	24,411 31	26,059 73
Vegetables.....	19,596 60	14,958 55	13,082 79	16,784 68	15,608 00	15,608 00	1,390,214 71	3,374 95	1,768 61	2,244 53
Wood.....	1,017,323 67	2,008,913 65	1,752,346 04	1,688,799 14	1,818,702 98	1,752,206 66	90,566 70	1,739,138 30	1,786,597 08	1,676,351 40
Wool.....	306 00	43,148 01	171,859 20	220,071 09	169,324 33	12,518 40	.....	26,826 40	30 00	55 75
Carried forward.....	\$ 11,047,905 98	\$ 11,844,583 34	\$ 11,074,808 01	\$ 11,671,118 92	\$ 13,272,011 89	\$ 15,572,660 31	\$ 18,305,440 09	\$ 20,804,555 53	\$ 21,449,500 65	\$ 19,300,930 25

COMMODITIES—(continued).

NOMENCLATURE.	1882-1883.	1883-1884.	1884-1885.	1885-1886.	1886-1887.	1887-1888.	1888-1889.	1889-1890.	1890-1891.	1891-1892.
Brought forward.....										
Bags.....	\$11,047,995 98	\$11,844,583 34	\$11,074,808 05	\$11,671,118 92	\$13,272,011 89	\$15,572,660 31	\$18,395,440 09	\$20,804,555 53	\$21,449,590 65	\$19,590,910 25
Cheese.....	207 50	18 00	10 00	2,800 00	2,480 00	8,030 10	13,277 00	23,333 00	3,129 00	2,524 00
Cotton seed.....				74 00	87 00	1,604 00	13,073 75	12,682 00	790 00	268,939 00
Feathers.....	1,372 90	1,900 12	1,055 75	2,255 00	2,960 00	910 00	1,331 00	3,224 00	17,911 00	7,449 00
Gypsum.....	4,010 00	700 00	6,575 00					6,842 00	4,699 00	7,992 08
Hats.....	2,251 12	5,086 02	2,266 25	4,223 25	4,777 65	5,997 47	6,668 82	8,070 75	12,680 77	6,666 50
Jalap.....	34,592 41	56,159 46	36,726 00	24,552 00	13,656 85	10,926 90	11,532 53	10,023 04	67,457 66	42,935 05
Lead.....	47,554 83	188,469 73	390,239 96	485,048 14	323,205 27	382,236 33	467,737 52	607,329 70	1,125,468 64	2,363,521 05
Other articles.....	120,979 84	146,427 99	202,469 79	135,638 50	74,312 13	105,706 95	100,911 13	10,731 50	73,883 44	75,511 82
Plants.....	2,200 00	3,273 26	9,103 50	8,656 48	10,235 35	16,692 75	13,635 40	21,069 00	15,151 00	18,326 70
Salt.....	525 00	3,860 00	1,512 00	2,217 00	2,235 00	3,633 25	6,481 00	5,645 00	2,765 25	15,035 68
Sarsaparilla.....	50,699 04	37,476 14	53,822 42	119,837 23	69,511 93	108,130 03	27,724 50	15,993 55	31,320 06	44,719 47
Tobacco.....	272,160 18	307,069 85	412,912 84	528,568 28	850,807 39	830,360 50	971,885 97	948,332 17	1,105,446 73	1,745,927 96
Value in paper.....	27,191 00	19,076 00	159,593 00		16,404 00	1,064 00	31,379 00	43,286 90	2,073,706 50	290,626 00
Vanilla.....	443,850 75	497,502 75	471,611 52	463,395 25	693,891 05	451,372 53	926,593 25	917,409 66	519,741 04	969,611 58
Zacaton (broom root).....	123,438 01	139,710 46	125,014 00	292,052 51	294,761 98	380,013 55	472,090 07	426,889 26	513,254 04	898,630 67
Total.....	\$12,178,938 56	\$13,252,213 12	\$12,896,794 08	\$13,741,316 56	\$15,651,427 49	\$17,870,720 67	\$21,373,148 03	\$23,878,098 46	\$27,020,023 18	\$26,330,410 97

RESUMÉ OF THE TOTAL EXPORTS.

Precious metals.....	\$20,628,657 69	\$33,473,283 30	\$33,774,050 92	\$29,006,400 83	\$33,560,502 56	\$31,006,187 71	\$36,781,274 99	\$38,621,290 23	\$36,286,372 16	\$42,137,393 98
Other articles.....	12,178,938 56	13,252,213 12	12,896,794 08	13,741,316 56	15,651,427 49	17,870,720 67	21,373,148 03	23,878,098 46	27,020,023 18	26,330,410 97
Total.....	\$32,807,596 25	\$46,725,496 42	\$46,670,845 00	\$42,742,717 30	\$49,211,930 05	\$48,885,908 38	\$58,154,423 02	\$62,499,388 69	\$63,306,395 34	\$71,467,714 95

DESTINATION AND VALUE OF EXPORTS FROM MEXICO IN THE FISCAL YEARS FROM 1882 TO 1892.

PRECIOUS METALS.

DESTINATION.	1882-1883.	1883-1884.	1884-1885.	1885-1886.	1886-1887.	1887-1888.	1888-1889.	1889-1890.	1890-1891.	1891-1892.
Belgium.....	\$ 298,037 55	\$ 980 00	\$ 372,556 98	\$ 1,500 00	\$ 52,490 00	68,076 21	\$ 71,575 00	\$ 35,908 85	\$ 53,813 40	\$ 18,067 00
Colombia.....	3,561,087 13	2,325,310 78	1,624,728 38	47,359 00	4,021,222 74	3,626,489 74	2,720,232 44	2,477,909 20	2,753,395 33	3,836,444 32
Costa Rica.....	392,955 02	408,591 14	628,028 95	3,000 00	1,000 00	1,281,803 76	954,722 26	1,764,446 75	2,484,012 02	2,484,012 02
France.....	15,201,600 36	17,265,462 28	13,784,962 91	9,417,463 53	11,122,019 69	7,935,735 71	10,459,403 10	10,865,360 47	8,045,962 89	12,165,795 23
Great Britain.....	92,875 00	130,915 00	61,400 00	2,000 00	2,300 00	33,881 25	253,096 07	114,385 65	168,601 15	83,573 00
Guatemala.....										
Honduras.....										
Nicaragua.....										
Russia.....										
Salvador.....	8,515 40	2,940 00	5,468 00	4,700 33	3,545 00	490 00	450 00	2,412 30	2,133 00	399 00
Spain.....	1,035,013 00	273,112 50	880,099 50	654,287 28	104,343 60	97,131 25	335,763 08	63,750 00	52,104 10	90,671 00
United States.....	9,036,773 33	12,822,240 50	16,404,776 20	15,496,336 17	16,576,120 09	17,915,115 83	23,647,919 80	24,098,147 31	23,400,832 94	39,447,566 41
Total.....	\$29,628,657 69	\$33,473,283 20	\$33,774,050 92	\$29,906,400 83	\$33,560,502 56	\$31,006,187 74	\$38,785,274 99	\$38,621,290 23	\$36,256,372 16	\$49,137,393 98

COMMODITIES.

Austria.....	\$ 29,040 00	\$ 69,329 00	\$ 32,370 00	\$ 73,128 00	\$ 67,326 42	\$ 51,583 16	\$ 50,544 00	.....	.....	\$ 15 00
Belgium.....	59,229 50	55,394 08	38,087 11	43,622 00	41,757 56	41,883 65	28,422 55	41,603 50	3,622 88	322,592 97
China.....	.....	730 00	.....	11,130 00	1,424 00	1,882 86	3,000 00	.....	212 00	20,272 75
Colombia.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,050 00
Costa Rica.....	642,218 42	556,688 20	610,728 27	48,160 18	71,108 40	84,823 57	765,805 84	681,060 16	890,156 00	807,041 17
Ecuador.....	732,163 29	759,684 89	782,575 65	726,770 28	885,839 89	839,593 37	773,137 33	739,030 89	1,029,458 11	1,866,170 56
France.....	2,056,162 25	2,064,689 87	1,536,317 10	2,126,104 21	2,424,100 88	2,605,229 52	2,076,129 52	2,856,122 05	2,836,765 44	3,100,160 45
Germany.....	686 00	1,773 87	400 00	25 00	2,706 00	946 00	4,267 60	3,265 05	25,080 35	60,167 17
Guatemala.....	.....	30 00	.....	.....	.....	.....	.....	.....	.....	.....
Holland.....	.....	14,044 00	22,187 44	.....	870 00	100 00	134,947 35	150,588 08	187,931 05	49,997 03
Honduras.....	.....	809 50	.....	.....	.....	.....	.....	.....	.....	4,460 00
Nicaragua.....	954,245 74	743,044 09	333,545 07	259,936 50	580,950 24	366,710 77	323,597 88	470,300 37	463,086 64	571,178 89
Spain.....	7,702,324 37	9,002,100 05	6,446,864 84	9,033,152 39	11,154,594 70	13,144,510 83	17,005,148 94	18,694,293 30	21,582,533 43	19,163,096 47
United States.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Carried forward.....	\$12,178,049 66	\$13,229,698 12	\$12,880,496 08	\$13,731,000 56	\$15,644,832 39	\$17,879,643 67	\$21,370,905 06	\$23,870,549 61	\$27,011,304 47	\$26,285,094 08

COMMODITIES—(Continued).

DESTINATION.	1882-1883.	1883-1884.	1884-1885.	1885-1886.	1886-1887.	1887-1888.	1888-1889.	1889-1890.	1890-1891.	1891-1892.
Brought forward.....	\$12,176,049 66	\$13,220,658 12	\$12,880,406 08	\$13,731,000 56	\$15,624,832 39	\$17,879,643 67	\$21,370,905 06	\$23,870,549 61	\$27,011,304 47	\$26,285,004 08
Argentine Republic.....	300 00	.....	70 00	10 00	570 00	52 00	500 00	4,555 00	920 00	100 00
Italy.....	.....	.....	.....	.....	.....	.....	787 60	266 00	1,206 71	10,014 01
Nicaragua.....	.....	.....	30 00	600 00	.....	25 00	.....	.....	.....	.....
Peru.....	.....	10,140 00	.....	.....	.....	.....	685 00	.....	4,000 00	26,200 00
Russia.....	.....	12,375 00	300 00	.....	280 00	.....	.....	300 00	2,502 00	3,120 00
Salvador.....	288 00	.....	48 00	.....	.....	.....	.....	.....	.....	.....
Switzerland.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Venezuela.....	300 00	.....	15,850 00	9,706 00	5,075 00	.....	200 00	2,346 00	.....	250 00
Total.....	\$12,176,049 66	\$13,220,658 12	\$12,880,406 08	\$13,741,316 56	\$15,631,427 39	\$17,879,720 67	\$21,373,147 66	\$23,878,106 61	\$27,020,083 18	\$26,330,410 98

TOTAL EXPORTS.

DESTINATION.	1882-1883.	1883-1884.	1884-1885.	1885-1886.	1886-1887.	1887-1888.	1888-1889.	1889-1890.	1890-1891.	1891-1892.
Argentina Republic.....
Austria.....	25 00	.....	.....	.....	.....	.....	100 00
Belgium.....	74,088 00	.....	.....	.....	.....	.....	15 00
China.....	340,659 97
Colombia.....	90,960 00	.....	.....	.....	.....	.....	.....
Costa Rica.....	14,130 00	.....	.....	.....	.....	.....	.....
Ecuador.....
France.....	3,036,276 78	.....	.....	.....	.....	.....	.....
Germany.....	1,571,390 20	.....	.....	.....	.....	.....	.....
Great Britain.....	11,600,067 74	.....	.....	.....	.....	.....	.....
Guatemala.....	2,023 00	.....	.....	.....	.....	.....	.....
Haiti.....
Holland.....
Honduras.....
Italy.....
Nicaragua.....
Peru.....
Russia.....
Salvador.....
Spain.....
Switzerland.....
United States.....
Venezuela.....
Total.....	\$11,807,593 35	\$16,735,386 42	\$16,670,845 00	\$13,647,715 42	\$19,101,930 05	\$18,885,908 38	\$21,158,423 02	\$22,409,388 60	\$23,276,305 34	\$25,467,714 95

TRADE BETWEEN MEXICO AND THE UNITED STATES.

It is quite difficult to make a correct statement of the trade between Mexico and the United States, because the official data of both governments never used to agree, especially on account of the different currencies prevailing in the two countries. As we have the silver standard, all our public accounts are kept in silver, and that makes our exports appear twice as large in value as they really are, when stated in the money of the United States, while we give our imports in the value of the country from whence they come, that is their gold value. That fact, which has often been overlooked, has caused the prevailing idea that there is a very large balance of trade in favor of Mexico, because the exports of United States commodities in Mexico amount to a given figure a year, the imports to this country of Mexican commodities amount to over double that figure ; but it must be borne in mind that the former is in silver while the latter is in gold. For instance, according to the Mexican Bureau of Statistics the imports into Mexico of merchandise from the United States in the fiscal year ended June 30, 1896, amounted to \$20,145,763, while the exports of metals and commodities from Mexico to the United States during the same year amounted to \$79,651,695, the proportion being almost four to one ; but if the imports are doubled as they ought to be, because the Mexican currency is silver, they amount to \$40,291,526, and if the exports of Mexico into the United States, calculated also in silver, are reduced to gold, they will amount to one half or \$39,825,847.50.

In corroboration of this statement I will mention the fact that according to the data of the Statistical Bureau of the United States Treasury Department, the exports to Mexico of commodities and precious metals from the United States during the last fiscal year, ending June 30, 1897, amounted to \$23,535,213 while the imports into the United States of commodities and precious metals amounted to \$30,714,366. Since March 1893, however, the Statistical Bureau of the United States Treasury Department, has reduced to gold the silver value of the Mexican metals and commodities imported in this country, and its data come now nearer to the mark, as in the year 1896 it gives the total exports of merchandise from this country into Mexico as \$19,450,256, while the total imports of merchandise from Mexico into this country are \$17,456,177.

The figures of our exports appear very large in the Mexican returns, because our merchandise is sold in gold markets, and their gold price is reduced to silver, and increased in the same proportion in which silver depreciates. It is not therefore the amount of merchandise which has increased so much, as that the price has been swollen in reducing it from gold to silver. In that regard the returns from the United States Statistical Bureau are more in conformity with the facts.

Another cause of the discrepancy between the statistics of both countries is that the Statistical Bureau of the United States Treasury Department had not, prior to March 3, 1893, any data of commodities exported to Mexico by way of the frontier, as there was no law which provided for the collection of such data, and a very large portion of the trade between the two countries is carried on by the frontier, especially since the railroads connecting both countries were finished.¹ That deficiency was only in relation to the exports, as the imports were duly declared for the payment of duties, and therefore the statistics of the United States necessarily were deficient and incomplete about the exports to Mexico of United States commodities, and that accounts in a great measure for the discrepancy between the official data published by both governments, and for the great discrepancy between exports and imports which appear in the statistics of the United States for those years.

From the preceding remarks it will be understood why there is such a great discrepancy between the data of the respective Bureaus.

It is very difficult to make a correct statement of the trade between the two countries previous to the organization of the Bureau of Statistics of the United States ; but I found in a book published in Washington in 1860 by Mr. Carlos Butterfield, entitled "The United States and Mexican Mail Steamship Line and Statistics of Mexico," a statement of the imports and exports between Mexico and the United States from 1826 to 1858, taken as he states from official data of the United States Treasury Reports, which I will use.

That statement is complemented by two tables furnished to me by Hon. Worthington C. Ford, Chief of the Bureau of Statistics of the Treasury Department. The first contains a statement of the trade between the United States and Mexico, during the forty-six years from 1851 to 1897, and the second is a full statement of that trade, including gold and silver during the same period. (Pages 174 and 175.)

I have prepared besides from the official publications of the Bureau of Statistics of the United States Treasury Department, a detailed statement of the commodities imported into the United States from Mexico, and exported from the United States to Mexico during the

¹ For these reasons the statements of the Statistical Bureau of the United States, previous to the fiscal year ended June 30, 1892, contained the following foot-note :

" In the absence of law providing for the collection of statistics of exports to adjacent foreign territory over railways, the values of exports to Mexico, from 1883 to 1893 inclusive, have been considerably under-stated. Since March, 1893, there has been a law in force for the collection of exports by railways. According to official information from Mexican sources, the value of imports into that country from the United States during the year ending June 30, 1888, was \$19,264,673, including precious metals valued at \$38,362. Prior to 1866 the figures include gold and silver imported and exported. For 1866 and subsequent years, merchandise only."

years 1858 to 1897, which is complete so far as the records of this government go, and contains very valuable information.

I will give first a partial statement prepared by the Bureau of Statistics of the Mexican Government of the total imports to Mexico and the imports from the United States of America from the fiscal year 1872-1873 to 1895-1896, and then another detailed statement prepared by the same Bureau of the total exports from Mexico and the exports to the United States of America from the fiscal year 1877-1878 to 1895-1896.

From said data it will be seen that the trade of Mexico with the United States is increasing very rapidly, notwithstanding the difficulty thrown in the way by high protective tariffs. Only a few years ago, as will be seen by the appended statement, our largest trade was with Great Britain, the United States occupying the second place, while now the United States occupies the first place, both in amount of our exports and imports.¹

Value of exports during the fiscal year 1872-1873 with their destination.

Great Britain.....	\$12,479,547.75	Guatemala and Honduras.	80,999.52
United States.....	11,366,530.76	Italy.....	17,389.00
France.....	4,604,417.38	Belgium....	4,784.00
Panama (New Grenada)...	1,579,015.12	Ecuador.....	2,931.75
Germany.....	802,643.83		
Spain and the Island of Cuba	752,891.91	Total	\$31,691,151.02

**TOTAL IMPORTS TO MEXICO AND IMPORTS FROM THE UNITED STATES
FOR THE FISCAL YEARS, 1872-1873 TO 1895-1896.**

	IMPORTS FROM THE UNITED STATES.	TOTAL IMPORTS.
	Value.	Value.
1872-1873.....	\$5,231,255	\$20,166,013
1873-1874.....	5,946,614	23,282,299
1874-1875.....	5,028,636	18,793,494
1884-1885 First 6 months.....	5,045,531	11,893,342
1885-1886 First 6 months.....	5,145,736	10,585,898
1888-1889.....	22,669,421	40,024,894
1889-1890.....	29,080,276	52,018,659
1892-1893.....	26,235,963	43,413,131
1893-1894.....	14,351,785	30,287,489
1894-1895.....	15,130,367	34,000,440
1895-1896.....	20,145,763	42,253,938

MEXICO, November, 1896.

¹ This statement is corroborated by the following extract from an official report addressed to Lord Salisbury by Mr. Lionel Carden, British Consul-General at the City of Mexico, on the trade of Mexico during the year 1896 :

"The great increase in the imports of American goods this year must be regarded by British merchants and manufacturers as another warning that unless they soon make a serious effort, they will have to give up all hope of profiting by the increase in the Mexican import trade, and may even lose part of the very limited share of it they at present enjoy."

TABLE SHOWING THE TOTAL EXPORTS FROM MEXICO AND THE EXPORTS TO THE UNITED STATES OF AMERICA FROM THE FISCAL YEAR 1877-1878 TO THE YEAR 1895-1896.

	EXPORTS TO THE UNITED STATES.			TOTAL EXPORTS FROM MEXICO.		
	Precious Metals.	Commodities.	Total.	Precious Metals.	Commodities.	Total.
1877-1878...	\$ 8,664,052	\$ 3,676,937	\$ 12,340,989	\$ 22,663,438	\$ 6,622,223	\$ 29,285,661
1878-1879...	7,439,815	4,741,724	12,181,539	21,528,938	8,362,540	29,891,478
1879-1880...	6,848,231	6,568,375	13,416,606	22,086,418	10,577,136	32,663,554
1880-1881...	7,601,767	6,556,424	14,158,191	19,354,704	10,573,994	30,928,698
1881-1882...	5,451,731	8,309,131	13,760,862	17,063,767	12,019,526	30,083,293
1882-1883...	9,036,773	7,702,325	16,739,098	20,628,658	12,178,937	41,807,595
1883-1884...	12,822,241	9,002,160	21,824,401	33,473,283	13,252,213	46,725,496
1884-1885...	16,404,776	9,448,285	25,853,061	33,774,051	12,896,794	46,670,845
1885-1886...	15,496,336	9,933,259	25,429,595	29,906,401	13,741,316	43,647,717
1886-1887...	16,576,120	11,152,555	27,728,675	33,560,503	15,631,427	49,191,930
1887-1888...	17,915,116	13,144,511	31,059,627	31,006,188	17,879,720	48,885,908
1888-1889...	23,647,920	17,805,443	40,853,363	38,785,275	21,373,148	60,158,423
1889-1890...	24,098,147	18,924,294	43,022,441	38,621,290	23,878,099	62,499,389
1890-1891...	23,400,833	21,522,253	44,923,086	36,256,372	27,020,083	63,276,395
1891-1892...	30,447,566	19,485,099	49,932,665	49,137,304	26,330,411	75,467,715
1892-1893...	40,113,882	23,723,761	63,837,643	56,504,305	31,004,916	87,509,221
1893-1894...	38,681,273	23,978,970	62,660,243	46,484,360	32,858,927	79,343,287
1894-1895...	38,852,843	28,470,143	67,322,986	52,535,854	38,319,099	90,854,953
1895-1896...	51,071,661	28,520,034	79,591,695	64,838,596	40,178,306	105,016,902
Total....	\$392,571,083	\$272,185,723	\$664,756,806	\$677,209,705	\$374,692,755	\$1,051,902,460

STATEMENT TAKEN FROM THE UNITED STATES TREASURY REPORTS OF THE COMMERCIAL TRANSACTIONS BETWEEN MEXICO AND THE UNITED STATES FROM 1826 TO 1850.

YEARS.	EXPORTS FROM MEXICO INTO THE UNITED STATES.	EXPORTS FROM THE UNITED STATES INTO MEXICO.	TOTAL TRADE BETWEEN THE TWO COUNTRIES.
1826.....	\$ 3,916,000	\$ 6,281,000	\$ 10,197,000
1827.....	5,232,000	4,163,000	9,395,000
1828.....	4,814,000	2,886,000	7,700,000
1829.....	5,026,761	2,331,151	7,357,912
1830.....	5,235,241	4,837,458	10,072,699
1831.....	5,167,000	6,178,000	11,345,000
1832.....	4,293,954	3,467,541	7,761,495
1833.....	5,459,818	5,408,091	10,867,909
1834.....	8,666,668	5,265,053	13,931,721
1835.....	9,490,446	9,029,221	18,519,667
1836.....	5,615,819	6,040,635	11,656,454
1837.....	5,654,002	3,880,323	9,534,325
1838.....	3,127,153	2,787,362	5,914,515
1839.....	5,500,707	2,164,097	7,664,804
1840.....	4,175,000	2,515,341	6,690,341
1841.....	3,484,957	2,036,620	5,521,577
1842.....	1,996,694	1,534,493	3,531,187
1843.....	2,782,406	1,471,937	4,254,343
1844.....	2,387,000	1,794,833	4,181,833
1845.....	1,702,936	1,152,331	2,855,267
1846.....	1,836,621	1,531,180	3,367,801
1847.....	746,818	692,428	1,439,246
1848.....	1,581,247	4,058,446	5,639,693
1849.....	2,216,719	2,090,869	4,307,588
1850.....	2,135,336	2,012,827	4,148,163
Total.....	\$102,245,303	\$85,610,237	\$187,855,540
Average.....	\$4,089,812	\$3,424,409	\$7,514,222

STATEMENT SHOWING THE COMMERCE IN MERCHANDISE BETWEEN THE
UNITED STATES AND MEXICO, BY YEARS AND DECADES, FROM 1851
TO 1897.

YEAR ENDING JUNE 30.	EXPORTS FROM THE UNITED STATES.			IMPORTS INTO THE UNITED STATES.			EXCESS OF EXPORTS (-) OR IMPORTS (+).
	Domestic.	Foreign.	Total.	Free.	Dutiable.	Total.	
1851.....	\$ 1,014,690	\$ 567,093	\$ 1,581,783	\$ 27,666	\$ 693,120	\$ 720,786	\$ -860,997
1852.....	1,406,372	878,557	2,284,929	20,564	534,700	555,264	-1,729,665
1853.....	2,529,770	1,029,054	3,558,824	4,148	751,952	756,100	-2,802,724
1854.....	2,091,870	1,043,616	3,135,486	111,405	826,451	937,856	-2,197,630
1855.....	2,253,368	668,236	2,921,604	17,508	887,242	904,750	-2,016,854
1856.....	2,404,692	1,237,097	3,701,789	79,966	773,792	853,758	-2,848,031
1857.....	3,017,640	597,566	3,615,206	62,307	964,566	1,026,873	-2,588,333
1858.....	2,782,852	529,973	3,312,825	246,894	861,607	1,108,501	-2,204,324
1859.....	2,252,162	667,580	2,919,742	234,112	1,009,972	1,244,084	-1,675,658
1860.....	3,309,379	2,015,334	5,324,713	586,016	1,317,415	1,903,431	-3,421,282
Total							
10 years..	\$ 23,122,795	\$ 9,234,106	\$ 32,356,901	\$ 1,390,586	\$ 8,620,817	\$ 10,011,403	\$ -22,345,498
1861.....	\$ 1,559,062	\$ 651,364	\$ 2,210,426	\$ 253,703	\$ 632,409	\$ 886,112	\$ -1,324,314
1862.....	1,840,720	340,454	2,181,174	289,011	411,977	700,988	-1,480,186
1863.....	7,441,579	1,579,045	9,020,624	446,070	2,597,812	3,043,882	-5,976,742
1864.....	7,765,133	1,505,664	9,270,797	385,037	5,743,408	6,128,445	-3,142,152
1865.....	13,819,972	2,530,807	16,350,779	369,915	5,850,959	6,220,874	-10,129,965
1866.....	3,701,599	871,619	4,573,218	402,568	1,323,524	1,726,092	-2,847,126
1867.....	4,823,614	572,182	5,395,796	402,779	669,157	1,071,936	-4,323,860
1868.....	5,048,420	1,392,919	6,441,339	482,228	1,108,439	1,590,667	-4,850,672
1869.....	3,835,999	1,047,408	4,883,407	511,319	1,824,845	2,336,164	-2,546,945
1870.....	4,544,745	1,314,955	5,859,700	522,907	2,192,758	2,715,665	-3,141,035
Total							
10 years..	\$ 54,380,543	\$ 11,806,277	\$ 66,186,820	\$ 4,065,537	\$ 22,385,288	\$ 26,450,825	\$ -39,735,995
1871.....	\$ 5,044,033	\$ 2,568,080	\$ 7,612,113	\$ 976,117	\$ 2,233,571	\$ 3,209,688	\$ -4,402,425
1872.....	3,420,658	2,122,931	5,543,589	1,156,257	2,846,663	4,002,920	-1,540,669
1873.....	3,941,019	2,323,882	6,264,901	3,065,140	1,211,025	4,276,165	-1,988,736
1874.....	4,016,148	1,930,691	5,946,839	3,026,661	1,319,703	4,346,364	-1,600,475
1875.....	3,872,004	1,865,278	5,737,282	3,863,302	1,311,292	5,174,594	-562,688
1876.....	4,700,978	1,499,594	6,200,572	3,920,633	1,229,039	5,150,572	-1,050,000
1877.....	4,503,802	1,389,692	5,893,494	3,756,191	1,448,073	5,204,264	-689,230
1878.....	5,811,429	1,649,275	7,460,704	3,723,281	1,528,221	5,251,502	-2,209,202
1879.....	6,000,380	1,351,864	7,352,244	3,981,402	1,511,819	5,493,221	-1,259,023
1880.....	6,065,974	1,800,519	7,866,493	4,852,659	2,356,034	7,208,593	-656,900
Total							
10 years..	\$ 46,776,425	\$ 18,501,806	\$ 65,278,231	\$ 32,321,643	\$ 16,997,240	\$ 49,318,883	\$ -15,959,348
1881.....	\$ 9,198,077	\$ 1,973,161	\$ 11,171,238	\$ 5,643,176	\$ 2,674,626	\$ 8,317,802	\$ -2,853,436
1882.....	13,324,505	2,158,077	15,482,582	5,310,706	3,151,103	8,461,809	-7,020,683
1883.....	14,370,992	2,216,628	16,587,620	4,211,328	3,065,795	7,277,123	-8,410,497
1884.....	11,089,603	1,614,689	12,704,292	5,334,689	3,681,797	9,016,486	-3,687,806
1885.....	7,370,599	970,185	8,340,784	5,173,441	4,093,580	9,267,021	-1,266,237
1886.....	7,267,129	692,428	7,959,557	6,808,757	3,879,215	10,687,972	-2,950,349
1887.....	9,242,188	655,584	9,897,772	9,928,122	4,791,718	14,719,840	-6,760,283
1888.....	10,886,288	600,608	11,486,896	11,042,772	6,287,117	17,329,889	-7,432,117
1889.....	12,666,108	619,179	13,285,287	13,825,242	7,428,359	21,253,601	-9,766,705
1890.....				15,536,100	7,154,815	22,690,915	-9,405,628
Total							
10 years..	\$ 102,271,566	\$ 12,382,085	\$ 114,653,651	\$ 82,814,423	\$ 47,108,125	\$ 129,922,548	\$ -15,268,897
1891.....	\$ 14,199,080	\$ 770,540	\$ 14,969,620	\$ 23,364,519	\$ 3,931,473	\$ 27,295,992	\$ -12,326,372
1892.....	13,696,531	597,468	14,293,999	23,702,496	4,405,029	28,107,525	-13,813,526
1893.....	18,891,714	676,920	19,568,634	27,145,469	6,409,630	33,555,099	-13,986,465
1894.....	12,441,805	400,344	12,842,149	21,500,011	7,166,995	28,727,006	-15,884,857
1895.....	14,582,484	423,422	15,005,906	12,903,789	2,731,999	15,635,788	-1,652,882
1896.....	18,686,797	703,459	19,450,256	13,819,698	3,636,479	17,456,177	-1,994,079
1897.....	22,726,596	694,468	23,421,064	13,990,017	4,521,555	18,511,572	-4,909,492
Total							
7 years..	\$ 115,225,007	\$ 4,326,621	\$ 119,551,628	\$ 136,485,999	\$ 32,803,160	\$ 169,289,159	\$ -49,737,531

Treasury Department, Bureau of Statistics,
September 4, 1897.

WORTHINGTON C. FORD,
Chief of Bureau.

STATEMENT SHOWING THE TOTAL COMMERCE BETWEEN THE UNITED STATES AND MEXICO, BY YEARS AND DECADES FROM 1851 TO 1897.

YEAR ENDING JUNE 30.	EXPORTS FROM THE UNITED STATES.			IMPORTS INTO THE UNITED STATES.			EXCESS OF EXPORTS (-) OR IMPORTS (+).
	Mer- chandise.	Gold and Silver.	Total.	Mer- chandise.	Gold and Silver.	Total.	
1851.....	\$ 1,581,783	\$ 2,652	\$ 1,584,435	\$ 720,786	\$ 1,083,993	\$ 1,804,779	\$ -220,344
1852.....	2,284,920	3,255	2,288,184	555,264	1,093,942	1,649,206	-638,978
1853.....	3,558,824	1,734	3,560,558	756,100	1,411,885	2,167,985	-1,392,573
1854.....	3,135,486	528	3,136,014	937,856	2,525,334	3,463,190	-1,327,176
1855.....	2,921,604	1,200	2,922,804	904,750	1,978,080	2,882,830	-39,974
1856.....	3,701,789	450	3,702,239	853,758	2,714,993	3,568,751	-133,558
1857.....	3,615,206	.....	3,615,206	1,026,873	4,958,984	5,985,857	-2,370,651
1858.....	3,312,825	3,000	3,315,825	1,108,501	4,368,964	5,477,465	-2,161,640
1859.....	2,919,742	72,804	2,992,546	1,244,084	4,095,890	5,339,974	-2,347,428
1860.....	5,324,713	20,360	5,354,073	1,903,431	5,032,441	6,935,872	-1,581,799
Total 10 years..	\$32,356,901	\$114,983	\$32,471,884	\$10,011,403	\$29,264,436	\$39,275,839	\$-6,803,955
1861.....	\$ 2,210,426	\$ 5,464	\$ 2,215,890	\$ 886,112	\$ 2,803,101	\$ 3,689,213	\$-1,473,323
1862.....	2,181,174	.....	2,181,174	730,988	1,953,864	2,684,852	-1,503,678
1863.....	9,020,024	51,588	9,071,612	3,040,882	1,485,702	4,526,584	-4,545,628
1864.....	9,270,597	3,410,957	12,681,554	6,128,445	1,755,946	7,884,391	-4,797,163
1865.....	10,350,830	664,241	17,015,080	6,220,874	1,133,209	7,354,073	-9,660,907
1866.....	4,573,218	15,000	4,588,218	1,726,092	2,429,511	4,155,603	-432,615
1867.....	5,395,796	56,452	5,452,248	1,071,936	2,849,038	3,920,974	-1,531,274
1868.....	6,441,330	12,924	6,454,254	1,590,667	4,525,255	6,115,922	-338,341
1869.....	4,883,107	2,000	4,885,107	2,336,164	4,895,842	7,232,006	-2,346,899
1870.....	5,359,700	15,606	5,375,306	2,715,665	10,382,366	13,097,931	-7,722,625
Total 10 years..	\$66,186,820	\$4,234,322	\$70,421,142	\$26,447,825	\$34,214,924	\$60,662,749	\$-9,758,393
1871.....	\$ 7,612,113	\$ 38,500	\$ 7,650,613	\$ 3,209,688	\$14,301,475	\$17,511,163	\$-9,860,550
1872.....	5,543,580	35,000	5,578,580	4,002,920	4,504,204	8,507,124	-2,928,543
1873.....	6,264,901	105,262	6,430,163	4,276,165	12,154,060	16,430,225	-10,000,062
1874.....	5,046,839	57,531	5,104,370	4,346,364	8,893,541	13,239,905	-7,235,535
1875.....	5,737,282	33,501	5,770,783	5,174,594	6,460,389	11,634,983	-5,864,200
1876.....	6,200,572	7,600	6,208,172	5,150,572	7,355,181	12,505,753	-6,297,581
1877.....	5,893,494	5,239	5,898,733	5,204,264	10,240,319	15,444,583	-9,545,850
1878.....	7,400,704	32,180	7,432,884	5,251,502	8,394,146	13,645,648	-6,212,764
1879.....	6,752,244	9,040	6,761,284	5,493,221	8,554,598	14,047,819	-7,286,535
1880.....	7,866,493	3,371	7,869,864	7,209,593	9,115,824	16,325,417	-8,455,553
Total 10 years..	\$65,278,231	\$387,224	\$65,665,455	\$49,318,883	\$89,973,737	\$139,292,620	\$-73,627,165
1881.....	\$11,171,238	\$ 1,500	\$11,172,738	\$ 8,317,802	\$ 9,136,324	\$17,454,126	\$-6,281,388
1882.....	15,482,522	18,446	15,500,968	8,461,899	6,631,938	15,093,837	-407,101
1883.....	10,587,620	96,964	10,684,584	8,177,123	9,782,986	17,960,109	-1,275,525
1884.....	12,704,222	335,635	13,039,857	9,016,486	13,015,901	22,032,387	-8,992,460
1885.....	8,340,784	79,400	8,420,184	9,267,021	14,919,611	24,186,632	-15,766,448
1886.....	7,737,623	110,035	7,847,658	10,687,972	16,935,396	27,623,368	-19,775,710
1887.....	7,959,557	279,812	8,239,369	14,719,840	14,855,765	29,575,605	-21,336,236
1888.....	9,897,772	319,408	10,217,180	17,329,889	14,032,637	31,362,526	-21,145,346
1889.....	11,486,896	176,616	11,663,512	21,253,601	17,557,248	38,810,849	-27,147,337
1890.....	13,285,287	240,912	13,526,199	22,690,915	18,155,809	40,846,724	-27,320,525
Total 10 years..	\$114,653,651	\$1,658,734	\$116,312,385	\$129,922,548	\$135,023,615	\$264,946,163	\$-148,633,778
1891.....	\$14,069,620	\$27,724	\$14,097,344	\$27,295,992	\$14,207,431	\$41,503,423	\$-26,396,069
1892.....	14,293,999	168,584	14,462,583	28,107,525	19,174,034	47,281,559	-32,818,976
1893.....	19,668,634	473,942	20,142,576	33,555,099	22,951,604	56,506,703	-36,464,127
1894.....	12,842,149	708,932	13,551,081	28,727,006	12,790,200	41,517,206	-27,966,124
1895.....	15,005,906	551,064	15,556,970	15,635,788	9,644,160	25,279,948	-10,722,978
1896.....	19,450,256	925,560	20,375,816	17,456,177	29,166,241	46,622,418	-26,246,602
1897.....	23,421,064	114,149	23,535,213	18,511,572	12,202,794	30,714,366	-7,179,153
Total 7 years..	\$119,551,628	\$3,170,065	\$122,721,693	\$169,289,159	\$120,226,463	\$289,515,622	\$-166,793,929

STATEMENT SHOWING THE QUANTITIES AND VALUES OF THE PRINCIPAL AND ALL OTHER ARTICLES OF IMPORTS INTO THE UNITED STATES FROM, AND OF EXPORTS FROM THE UNITED STATES TO, MEXICO, 1858-1883.

IMPORTS OF MERCHANDISE FROM MEXICO.

YEAR ENDING JUNE 30	BREADSTUFFS AND OTHER FARINA- CEOUS FOOD.*		COFFEE.		COPPER, PIGS, BARS, INGOTS, OLD, AND OTHER UNMANUFACTURED.	Cochi- neal and Indigo.	CHEMICALS, DRUGS, DYES AND MEDICINES.		HIDES AND SKINS OTHER THAN FURS.	HAIR UN- MANU- FACTURED.	INDIA RUBBER AND GUTTA-PERCHA, CRUDE OR UNMAN- UFACTURED.		JUTE, AND OTHER GRASSES, RAW.
	Indian corn.	All other.	POUNDS.	\$	POUNDS.		Dye- woods in sticks.	All other.†			POUNDS.	\$	TONS.
1858...	34,686	928,108	29,687	3,299	1,437	31,793	107,640	1,090	496,089	11,261	.....	.....	406
1859...	45,590	15,794	45,518	6,036	3,038	144,437	46,228	1,336	457,497	485	.....	.....	360
1860...	26,940	5,124	46,616	6,016	10,543	49,631	161,115	110	535,591	2,074	.....	.....	951
1861...	10,612	2,445	46,116	59,405	1,390	91,045	115,757	.....	297,597	2,264	.....	.....	382
1862...	.....	6,390	7,175	1,066	1,734	49,504	91,976	.....	171,905	11,535	1,586	.....	286
1863...	15,048	.....	935,594	122,663	14,081	91,151	48,004	.....	383,530	912	.....	.....	868
1864...	.....	9,818	11,736	2,987	21,401	123,434	110,990	12,622	593,978	2,140	.....	.....	843
1865...	.....	6,337	.....	109	10,598	134,950	136,341	7,127	547,100	1,667	.....	.....	333
1866...	.....	.....	594,777	84,478	5,689	90,368	69,350	40,722	325,186	3,196	.....	.....	889
1867...	9,975	5,183	136,005	18,468	3,001	130,154	108,754	39,004	368,817	2,613	.....	.....	862
1868...	34,969	90,599	882,521	112,159	7,326	144,144	187,337	38,586	411,905	2,728	.....	.....	1,513
1869...	71,163	53,140	803,048	22,062	7,360	144,974	207,859	64,510	745,550	2,613	.....	.....	3,906
1870...	79,321	48,551	110,607	13,223	2,304	144,936	241,932	28,380	833,743	4,597	.....	.....	3,308
1871...	104,554	68,313	506,495	59,454	18,608	177,745	36,668	286,781	1,380,082	15,040	.....	.....	3,368
1872...	74,297	43,114	1,878,301	248,022	218	104,772	39,660	163,745	714,486	6,442	93,046	.....	4,444
1873...	53,547	62,790	314,347	34,347	3,120	55,230	27,552	103,745	1,093,387	55,490	184,554	63,269	3,590
1874...	61,081	37,790	2,030,385	624,611	2,126	61,094	65,662	70,090	1,561,830	18,625	72,963	23,710	4,867
1875...	33,668	31,022	1,878,889	485,486	6,600	54,519	63,958	158,279	2,077,156	28,784	115,607	35,600	6,185
1876...	45,990	49,022	3,041,229	713,833	23,050	39,736	150,413	219,193	1,812,567	79,230	39,835	11,103	6,846
1877...	25,791	39,411	6,786,693	1,265,970	7,017	54,766	72,402	204,135	1,589,702	29,317	43,314	13,825	7,278
1878...	12,321	34,339	6,337,063	1,082,272	7,082	23,106	112,482	204,135	1,565,546	42,770	40,494	11,364	6,163
1879...	33,497	56,432	8,307,040	1,371,979	3,302	62,443	96,877	159,017	1,675,777	34,274	17,500	44,235	12,017
1880...	65,230	65,102	9,818,595	1,523,658	19	68,345	149,651	166,706	2,081,018	36,964	207,026	44,235	12,017
1881...	87,840	43,141	13,011,010	1,730,838	6,825	80,973	126,070	263,622	2,111,750	39,701	616,742	315,050	17,153
1882...	28,668	41,259	17,000,666	1,817,564	494	5,813	128,724	108,030	1,585,107	52,810	325,206	164,870	19,433
1883...	22,072	50,102	8,578,532	809,757	124	.....	211,714	119,681	1,568,645	52,085	241,478	123,444	25,065

* All other breadstuffs comprise barley, barley malt, bread and biscuit, oats, rice, rye, wheat, wheat flour, meal of all kinds, peas and beans; all other farinaceous food and preparations of breadstuffs.

† All other chemicals, drugs, dyes, and medicines include: Argols; medicinal barks; camphor, crude; madder; soda, nitrate of; gums; cutch and catechu; opium; soda and salts of; sulphur or brimstone; chloride of lime or bleaching powder; all chemicals, not elsewhere specified.

‡ Cochineal only; no indigo included.

MEXICO, 1858-1883—Continued.
IMPORTS OF MERCHANDISE FROM MEXICO—Continued.

YEAR ENDING JUNE 30—	LEAD, PIGS, BARS, AND OLD,	ANIMALS, LIVING.	PRECIOUS STONES.	SALT.	SPICES OF ALL KINDS.	SUGAR AND MOLASSES OF ALL KINDS.	WOOL, RAW AND FLECE.	WOOD, UNMANU- FACTURED.	OTHER MERCHAN- DISE.	TOTAL IM- PORTS OF MERCHAN- DISE.
	POUNDS.				\$	\$	POUNDS.	\$	\$	\$
1858.....	36,517			6,285	1,252	9,569	4,137	43,674	275,901	1,108,201
1859.....	91,440	825		11,321	1,272	8,273	9,864	55,940	360,964	1,244,084
1860.....	320,141	1,899		24,555	624	55,309	15,151	101,398	819,195	1,903,431
1861.....	57,482	6,203		12,266	1,835	23,333	1,641	102,711	141,120	886,112
1862.....		1,150		16,138	1,531	10,886	31,209	51,415	280,310	750,988
1863.....	905,136	13,688		40,871	3,959	45,576	155,450	60,014	1,684,068	3,043,882
1864.....	4,699	997		36,247	22,872	12,219	1,226,820	66,348	1,697,890	6,128,445
1865.....	648	60		6,452	10,836	816	702,676	83,921	5,188,666	6,280,874
1866.....	25,152	1,509		12,326	30,920	70,304	163,297	82,908	1,726,092	1,726,092
1867.....				13,645	10,041	1,693		106,921	127,392	1,071,936
1868.....	79,504	2,799		21,368	40,324	29,735	64,493	72,972	217,404	1,590,667
1869.....	523,043	22,211		13,716	33,841	65,197	716,068	126,345	225,821	2,336,164
1870.....	456,516	14,697		30,235	104,476	28,123	656,459	107,858	377,016	2,715,565
1871.....	725,211	23,261		29,600	124,403	39,877	865,909	176,724	908,208	3,209,683
1872.....	461,274	14,653		20,984	10,306	52,007	1,182,481	279,020	263,991	4,002,920
1873.....	392,440	19,304		6,963	1,613	11,818	1,182,414	190,475	550,070	4,276,165
1874.....	871,579	41,978	330	9,844	2,100	17,682	1,173,099	324,520	379,557	4,346,364
1875.....	325,648	16,669	102,048	8,201	1,882	104,547	1,095,222	346,923	756,226	5,174,594
1876.....	837,668	42,253	156,690	6,803	1,520	164,567	838,798	247,633	735,763	5,150,572
1877.....	68,218	58,218	108,050	7,166	5,481	227,543	1,405,083	133,690	533,176	5,144,264
1878.....	1,336,641	58,215	120,897	6,768	1,650	155,700	1,405,083	227,853	580,051	5,251,592
1879.....	1,136,453	20,839	132,871	6,138	3,760	76,992	819,764	224,925	590,001	5,403,221
1880.....	497,276		3,927	8,419	9,040	232,615	1,321,874	408,754	886,136	7,800,993
1881.....	630,947	27,661	175,395	7,178	5,210	92,255	1,009,376	320,295	974,452	8,317,802
1882.....	1,132,024	44,365	21,637	7,802	8,428	104,374	101,666	409,776	1,212,201	8,461,609
1883.....	1,101,225	26,919	56,176	973	10,775	64,527	1,775	441,083	1,244,548	8,177,123

* Of this amount \$60,497 was the value of unmanufactured cotton.

† Of this amount \$1,750,615 was the value of unmanufactured cotton.

‡ Of this amount \$4,596,725 was the value of unmanufactured cotton.

§ Of this amount \$5,228,875 was the value of unmanufactured cotton.

|| Of this amount \$417,197 was the value of unmanufactured cotton.

MEXICO, 1858-1883—Continued.

EXPORTS OF DOMESTIC MERCHANDISE TO MEXICO.

YEAR ENDED JUNE 30—	SHEEP.		BREAD AND BREADSTUFFS.		COTTON, RAW OR UNMANUFACTURED.
	NO.	.....	Indian corn.		
			BUSHELS.	Wheat and wheat-flour.	
1858.....	.....	.....	\$ 37,676	\$ 130,673	\$ 3,660
1859.....	.....	.....	49,579	59,886	4,137
1860.....	.....	.....	48,932	78,063	8,147
1861.....	.....	.....	86,329	9,993	10,920
1862.....	.....	.....	13,377	14,017	31,915
1863.....	.....	.....	18,304	263,849	379,727
1864.....	.....	.....	268,653	187,014	50,730
1865.....	.....	.....	187,462	286,024	66,227
1866.....	280	\$ 740	181,462	347,464	90,738
1867.....	33	590	158,624	121,353	117,066
1868.....	543	2,800	14,218	16,874	3,310,848
1869.....	2,133	7,292	9,051	547,905	8,228,598
1870.....	(1)	72,216	72,439	343,205	2,042,224
1871.....	27,481	18,189	65,292	278,111	6,609,707
1872.....	36,347	32,837	173,585	209,371	11,309,468
1873.....	27,228	25,443	21,039	215,718	957,209
1874.....	57,217	59,935	104,146	218,879	550,630
1875.....	121,445	110,590	55,881	110,525	2,286,561
1876.....	112,553	133,222	9,862	96,666	1,303,276
1877.....	95,215	104,865	9,092	102,173	6,972,575
1878.....	161,549	144,908	75,487	108,932	3,966,812
1879.....	153,065	141,776	55,658	88,913	3,422,162
1880.....	86,669	103,789	267,623	171,450	9,698,199
1881.....	115,265	120,613	93,802	129,071	9,181,543
1882.....	108,886	118,498	85,702	69,072	13,386,186
1883.....	81,338	112,421	322,510	240,162	12,537,650
1884.....	235,585	364,866	476,453	391,751	1,447,322
					2,217,771

* Bread and breadstuffs, all other, comprise barley, bread and biscuit, Indian corn-meal, oats, rye, rye-flour, other small grain and pulse, maizena, farina, and all other breadstuffs, or preparations of, used as food.

† Classified under the general heading "Animals, living, all kinds," total, \$156,773.

EXPORTS OF DOMESTIC MERCHANDISE TO MEXICO—Continued.

YEAR ENDED JUNE 30—	COTTON, MANUFACTURES OF.			DRUGS, CHEMICALS, MEDICINES, ACIDS, ASHES, AND DYE-STUFFS.	GLASS AND GLASSWARE.	IRON AND STEEL, AND MANUFACTURES OF.*	LEATHER, AND MANUFACTURES OF.	
	Colored.		Uncolored.				Boots and Shoes.	All other.
	YARDS.	All other.						
1858.....	\$ 29,937	\$ 8,011	\$ 188,814	\$ 1,066	\$ 4,404
1859.....	34,886	7,697	91,472	9,345	5,873
1860.....	61,777	5,081	329,326	8,999	4,904
1861.....	48,710	5,763	235,397	4,368	6,395
1862.....	75,104	14,486	265,225	9,676	4,607
1863.....	118,664	43,224	704,944	285,543	112,334
1864.....	166,741	49,670	1,105,541	373,146	67,404
1865.....	340,675	126,447	1,423,571	1,119,848	160,203
1866.....	89,690	23,515	480,094	34,131	35,114
1867.....	68,137	16,813	770,190	21,533	21,699
1868.....	85,635	27,010	811,364	61,287	23,874
1869.....	73,578	27,076	854,268	95,590	18,430
1870.....	113,105	21,217	654,268	116,761	11,591
1871.....	96,248	18,905	608,266	91,070	16,970
1872.....	93,734	26,419	803,668	68,565	18,480
1873.....	107,436	26,759	1,043,071	104,377	13,613
1874.....	126,437	20,007	1,073,530	70,417	12,757
1875.....	111,877	37,561	1,073,530	84,120	26,026
1876.....	111,348	20,743	1,062,687	70,153	11,182
1877.....	70,709	24,763	786,365	53,383	14,233
1878.....	123,060	56,668	1,201,574	60,950	27,719
1879.....	127,756	47,811	1,206,080	58,500	21,124
1880.....	145,131	54,781	1,237,721	53,466	25,133
1881.....	212,477	87,313	1,584,346	48,207	43,963
1882.....	288,824	111,542	1,429,718	85,327	65,517
1883.....	265,220	139,099	3,779,287	86,768	65,102

* Including, also, printing presses and type, scales and balances, sewing machines and parts of, steam and other fire engines and apparatus.
† Included in "All other."

Statistical Notes on Mexico.

EXPORTS OF DOMESTIC MERCHANDISE TO MEXICO.—Continued.

YEAR ENDED JUNE 30—	ORDNANCE STORES.			PROVISIONS.*			SUGAR AND MOLLASSES.	TOBACCO AND MANU- FACTURES OF.	WOOD AND MANUFAC- TURES OF.	OTHER MERCHANDISE.	TOTAL EXPORTS OF DOMESTIC MER- CHANDISE.	TOTAL EXPORTS OF FOREIGN MERCHANDISE.	TOTAL EXPORTS OF MERCHANDISE.	
	Cartridges and Rifles.		All other.	Bacon and Hams.		Lard.								All other.*
	Gunpowder.	Pounds.		Pounds.	Pounds.									
1883.....	104,040	16,406	37,955	1,302,134	161,797	12,213	394,572	73,298	141,185	1,385,480	2,811,760	2,811,760	5,623,520	
1884.....	115,320	18,115	31,012	1,483,477	145,397	136,168	371,919	71,782	122,671	1,406,111	13,384,595	2,158,077	15,542,672	
1885.....	145,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1886.....	155,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1887.....	171,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1888.....	187,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1889.....	193,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1890.....	209,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1891.....	225,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1892.....	241,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1893.....	257,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1894.....	273,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1895.....	289,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1896.....	305,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1897.....	321,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1898.....	337,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1899.....	353,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	
1900.....	369,320	22,350	30,350	1,666,312	166,312	170,765	466,150	63,725	135,174	1,406,111	13,384,595	2,158,077	15,542,672	

* Provisions, all other, comprise: Beef, salted or cured; beef, fresh; butter, cheese, condensed milk; eggs; fish, dried, smoked, fresh, pickled, other cured; meats, preserved mutton, fresh; oysters; pickles and sauces; pork; onions; potatoes; other vegetables; vegetables, prepared or preserved.

STATEMENT SHOWING THE QUANTITIES AND VALUES OF THE PRINCIPAL AND ALL OTHER ARTICLES OF IMPORTS INTO THE UNITED STATES FROM, AND OF EXPORTS FROM THE UNITED STATES TO, MEXICO, DURING EACH OF THE YEARS SPECIFIED BELOW.

MERCHANDISE.—MEXICO, 1889-1897

IMPORTS OF MERCHANDISE.																
YEAR ENDING JUNE 30—	Breadstuffs and other farinaceous food.		Coffee.		Copper: Pigs, bars, ingots, old, and other unmanufactured.		Chemicals, drugs, dyes, and medicines.			Hides and skins, other than furs.	Hair unmanufactured.	India rubber and gutta percha, crude.		Jute and other grasses unmanufactured.		Lead and Manufactures of.
	Corn.	All other.	POUNDS.		POUNDS.		Cochi- neal and indigo.	Dye- woods in sticks.	All other.			POUNDS.	TONS.	POUNDS.	TONS.	
1889...	\$1,082	\$1,837	18,243,317	\$2,895,862	81,471	\$4,893	\$1,000	\$187,862	\$1,142,124	\$1,526,915	\$47,452	233,096	41,389	\$6,257,610	\$549,257	
1890...	871	3,025	20,666,975	3,542,851	30,607	2,948	12,571	104,532	1,155,390	1,579,250	57,066	177,801	59,826	5,851,822	657,658	
1891...	1,463	22,046	28,489,632	5,094,839	283,744	23,560	10,915	102,445	1,888,813	1,646,369	61,098	169,343	56,666	6,047,593	1,847,969	
1892...	8,102	3,165	21,921,549	4,037,592	1,106,222	84,175	3,745	119,457	1,396,667	1,704,872	60,557	120,528	52,021	5,542,985	3,596,728	
1893...	1,093	2,279	25,417,152	4,297,880	1,521,762	134,997	38,411	145,725	1,340,088	1,653,775	61,711	140,096	60,550	6,687,947	5,646,481	
1894...	924	1,828	38,166,641	6,964,034	1,821,163	213,377	681	88,390	1,245,595	1,438,277	57,064	120,415	32,723	3,949,401	6,463,346	
1895...	6,090	10,283	35,262,220	5,971,439	2,213,102	155,645	345	102,160	953,185	1,433,045	43,846	160,808	59,706	3,375,098	1,423,150	
1896...	1,465	12,201	23,975,477	4,040,443	5,544,429	452,712	318	125,774	2,049,715	1,519,301	43,261	124,343	65,441	4,229,531	1,350,773	
1897...	1,046	10,310	26,733,370	4,591,099	7,072,378	580,241	.....	124,066	1,537,371	1,778,225	58,228	106,871	70,692	4,235,624	1,435,891

IMPORTS INTO, AND EXPORTS FROM, THE UNITED STATES FROM AND TO MEXICO, ETC.—Continued.
MEXICO, 1889-1897—Continued.

YEAR ENDING JUNE 30—	IMPORTS OF MERCHANDISE.						
	Animals.	Precious stones.	Salt.	Spices of all kinds.	Sugar and molasses.	Wool, unmanufactured.	Wood, unmanufactured.
1889.....	\$399,493	\$11,996	\$2,302	\$9,978	\$7,022	POUNDS. 761,828	\$301,142
1890.....	417,025	57,614	3,516	16,413	27,129	322,166	8,579,184
1891.....	140,622	3,025	4,659	11,997	35,460	1,799	441,660
1892.....	20,257	911	2,369	12,575	40,790	263	9,764,647
1893.....	36,321	1,164	11,933	19,891	48,157	909	10,721,702
1894.....	24,415	3,672	387	19,595	69,618	10,727	12,743,844
1895.....	760,000	10,121	440	15,156	55,156	5,798	7,791,600
1896.....	1,520,044	3,840	2	14,066	63,622	95,824	1,043,700
1897.....	1,054,783	847	1,451	30,135	19,111	140,053	1,378,103
						7,628	1,572,552
							\$1,953,601
							\$2,600,015
							\$7,204,441
							\$8,107,525
							\$3,555,099
							\$8,727,006
							\$15,635,794
							\$17,456,177
							\$18,511,572

YEAR ENDING JUNE 30—	EXPORTS OF DOMESTIC MERCHANDISE.				
	ANIMALS.	BREADSTUFFS.		Chemicals, dyes, and medicines.	Cotton, unmanufactured.
		Corn.	Wheat and wheat flour.	All other.	
1889.....	NUMBER. 77,566	BUSHELS. 434,097	\$185,746	\$85,558	POUNDS. 10,601,267
1890.....	26,814	901,458	166,766	100,997	23,047,474
1891.....	9,147	615,339	213,999	125,718	12,841,122
1892.....	2,827	754,548	184,899	127,443	22,117,381
1893.....	1,310	6,960,356	230,576	144,031	20,995,980
1894.....	5,443	431,516	197,194	100,508	37,582,418
1895.....	900	179,611	125,637	80,649	21,351,290
1896.....	2,122	1,676,758	167,680	85,542	10,468,420
1897.....	4,628	8,825,860	96,794	128,527	15,103,628
					\$1,607,395
					\$1,217,865
					\$1,281,072
					\$1,544,500
					\$1,860,461
					\$1,391,836
					\$2,351,290
					\$1,643,185
					\$1,936,447

IMPORTS INTO, AND EXPORTS FROM, THE UNITED STATES FROM AND TO MEXICO, ETC.—Continued.
MEXICO, 1889-1897.—Continued.

EXPORTS OF DOMESTIC MERCHANDISE.												
YEAR ENDING JUNE 30—	COTTON, MANUFACTURES OF.				Glass and Glass-ware.	GUNPOWDER AND OTHER EXPLOSIVES.		Iron and steel, and manufactures of.	LEATHER, AND MANU-FACTURES OF.			
	Cloths, colored.		Cloths, uncolored.	All other.		Gun-powder.	All other explosives.		Boots and Shoes.	All other.		
	YARDS.	\$										
											YARDS.	\$
1889.....	7,735,000	461,765	138,004	218,803	76,833	10,227	283,704	2,890,757	30,081	48,648		
1890.....	7,135,000	314,888	153,875	179,408	94,667	15,723	348,845	2,700,979	38,059	54,794		
1891.....	5,434,888	317,576	126,753	156,053	126,088	18,080	375,380	3,414,397	24,366	48,231		
1892.....	5,450,785	347,087	144,399	155,368	123,546	8,767	410,513	3,824,343	21,084	38,708		
1893.....	6,381,092	295,850	86,643	140,323	117,079	6,265	454,775	3,808,876	26,731	44,348		
1894.....	3,245,200	197,855	136,663	151,575	112,972	43,088	572,031	3,793,566	24,843	58,245		
1895.....	3,184,205	244,114	145,430	151,084	121,488	74,805	597,706	5,230,307	26,532	51,648		
1896.....	4,278,358	311,532	2,540,396	322,790	162,688	75,657	671,036	6,425,645	45,115	66,943		
1897.....	5,328,808	231,527	1,706,708	346,710	168,437				58,639	63,453		
1897.....	3,867,100											

EXPORTS OF DOMESTIC MERCHANDISE.												
YEAR ENDING JUNE 30—	Oils: Mineral, refined.	PROVISIONS, COMPRISING MEAT AND DAIRY PRODUCTS.				Quick-silver.	Sugar and molasses.	Tobacco, and manufactures of.	Wood, and manufactures of.	Other merchandise.	Total exports of domestic merchandise.	Total exports of foreign merchandise.
		Bacon and hams.		Lard.	All other.							
		POUNDS.	\$									
1889.....	977,657	41,889	128,169	386,117	66,843	133,757	964,310	2,678,444	10,886,373	600,608		
1890.....	959,658	34,021	119,076	433,068	42,035	130,440	1,303,448	3,919,360	12,666,168	619,179		
1891.....	901,829	34,099	109,816	408,341	36,493	73,535	1,483,993	5,839,066	15,590,080	770,540		
1892.....	938,052	43,887	142,853	411,349	34,448	86,394	1,800,672	3,506,236	13,606,531	597,468		
1893.....	108,740	422,386	380,457	193,414	34,448	186,745	1,800,486	4,671,554	18,561,714	676,990		
1894.....	146,686	34,993	368,449	143,381	57,452	186,805	998,865	3,846,066	12,441,865	900,344		
1895.....	997,599	33,754	116,108	173,281	37,408	167,065	1,048,844	4,249,783	14,584,484	423,422		
1896.....	148,819	34,113	186,779	164,853	38,731	175,541	1,611,477	5,795,658	18,686,797	763,452		
1897.....	340,546	36,123	209,727	466,959	99,395	122,387	2,163,446	5,072,807	22,786,591	604,468		
1897.....	365,764			160,769								

Increase of trade during the year 1896-97.—The data given in the chapter on Foreign Trade contain detailed statements of the amount of commodities and precious metals exported from Mexico into the United States during the last ten years, and I refer, therefore, to the same, those desiring more detailed information on that subject.

I give, however, a statement of the leading merchandise imported from Mexico into the United States, during the last fiscal year, compared with the fiscal year ended June 30, 1896, embracing only such imports as are not specifically stated in the data taken from the official reports of the United States Statistical Bureau, and which appear on pages 176 and 177. The following data, also taken from the last official report of the same Bureau, shows a comparative increase of trade.

LEADING MERCHANDISE IMPORTS FROM MEXICO.

	FISCAL YEAR 1896-1897.	FISCAL YEAR 1895-1896.
Henequen, tons.....	62,839	51,167
Value.....	\$3,809,415	\$3,339,180
Ixtle fibre, tons.....	6,313	12,207
Value.....	\$335,841	\$717,585
Oranges, value.....	\$258,340	\$212,913
Tobacco, lbs.....	749,560	93,197
Value.....	\$297,262	\$28,025
Mahogany, feet.....	8,791	10,654
Value.....	\$321,800	\$414,817
Coal, tons.....	99,760	72,056
Value.....	\$218,456	\$146,813

I also append a similar statement of some of the articles exported from the United States into Mexico during the last fiscal year, compared with the previous one, ended June 30, 1896, embracing only such exports as are not specifically stated in the data taken from the official reports of the United States Statistical Bureau, appearing on pages 178 to 183, and which I also take from the last official report of the same Bureau. When it is taken into consideration that the Mexican imports from the United States during the last fiscal year were made on a falling silver market, the annexed statement shows a considerable financial strength.

EXPORTS FROM THE UNITED STATES TO MEXICO.

(Fiscal year 1896-97 and preceding year.)

	1896-97.	1895-96.
Cattle, no.....	690	1,112
Value.....	\$29,186	\$39,509
Hogs, no.....	22,164	17,540
Value.....	\$263,083	\$206,807

	1896-97.	1895-96.
Agricultural implements.....	\$130,825	\$119,838
Books, maps, etc.....	\$161,143	\$107,384
Carriages and cars.....	\$615,468	\$687,425
Coal and coke, tons.....	219,111	121,269
Value.....	\$643,715	\$377,469
Bicycles.....	\$73,117	\$24,278
Fruits and nuts.....	\$72,654	\$78,497
Hops.....	\$55,610	\$8,289
Hardware.....	\$2,874,283	\$2,455,400
Leather.....	\$16,456	\$24,014
Crude petroleum, gals.....	7,090,853	6,779,059
Value.....	\$349,021	\$392,510
Refined petroleum, gals.....	836,628	631,147
Value.....	\$174,107	\$142,761
(Includes lubricating oil.)		
Cotton-seed oil, gals.....	1,616,407	1,588,504
Value.....	\$320,496	\$337,892
Paraffin, lbs.....	2,888,475	2,975,476
Value.....	\$144,805	\$163,644
Tallow, lbs.....	997,216	1,783,788
Value.....	\$36,561	\$77,050
Hams.....	\$28,976	\$29,487
Butter.....	\$40,089	\$33,169
Wool, lbs.....	1,698,952	2,605,150
Value.....	\$140,609	\$238,316

Tropical Products Supplied by Mexico to the United States.—It will be interesting to state in what proportion Mexican imports of tropical products figure in the total imports of said commodities into this country.

From 1892 to 1896 the annual average of importation of vanilla beans into the United States was 205,197 pounds, of which Mexico furnished 142,727 pounds, or 69½ per cent. Mexico receives for her vanilla crop, annually, \$640,000 gold.

Mexico's average annual exportation of coffee to the United States for the past five years was 28,927,410 pounds, or 4.8 per cent., of the total American purchase of coffee, Brazil furnishing 70 per cent., Central America 7.6 per cent., Venezuela 6.4 per cent., and the British West Indies 1.1 per cent. There is plenty of room for the Mexican coffee-growing industry to expand. Mexico's fine flavored, mild coffees are steadily gaining in favor in the United States.

In henequen, or sisal grass, Mexico takes the leading place in the import trade of the United States, selling, of the total received there, 98.1 per cent. The average annual importation for the past five years was 50,129 tons, of which Mexico furnished 49,195, Cuba 277, British Australia 386, and all other countries 271. Mexico received a yearly average, during the five years, for her henequen, of \$4,218,267, gold. All of which went to the State of Yucatan.

In sugar, Mexico holds but an insignificant place in the American importation, which showed an annual average, during the past five years, of 3,827,799,481 pounds, Cuba furnishing 46.5 per cent. and Hawaii 7.9 per cent.

We could expand very largely our sugar production and supply this country with almost all of that product, but as sugar is produced in Louisiana and as Hawaii is likely to belong to the United States the protective policy of this country will not allow us to supply the United States with that commodity on a large scale.

Mexico is sending on an average every year, 1,400,000 pounds of wool to the United States. In 1892 she exported but 190 pounds.

The United States takes, annually, an average of 50,493,000 pounds of goat skins, of which Mexico furnishes 3,007,000, or 5.9 per cent. Of other hides and skins the United States imports 167,993,000 pounds, Mexico's share being 4.3 per cent.

The cattle trade of Mexico with the United States increased considerably under the liberal provisions of the Wilson Bill, which taxed cattle with 20 per cent. ad valorem. The following statement shows how large the increase of that trade was under that bill :

CATTLE EXPORTED TO THE UNITED STATES.

Years.	Number.	Gold Value.
1892.....	1,438.....	\$ 7,740
1893.....	2,597.....	16,376
1894.....	1,469.....	11,857
1895.....	148,431.....	720,864
1896.....	216,913.....	1,481,954

(Fiscal years ended June 30th.)

Mexico has been for at least two years the most important source of supply to the United States for cattle purchased abroad, Canada furnishing, in 1896, cattle to the value of but \$18,902, and the United Kingdom \$6,684. The cattle trade is one in which American, as well as Mexican capital is embarked, but it will be considerably diminished if not completely destroyed under the highly protective tariff.

COINAGE.

In the chapter on Mining I gave a concise statement of the silver and gold coined in Mexico from the time of its discovery by the Spaniards to the fiscal year ended June 30, 1896, and it appears from the same that the total coinage of silver amounted to \$3,398,664,400.

According to the report of the Director of the Mint (page 347) on the "Production of Precious Metals in the United States during

the Calendar Year 1895," the last one out as this paper goes to press, the total production of silver of the world from 1493 to 1895 is \$10,345,688,700, the Mexican coinage being over one-third of the whole.

It must be borne in mind that that statement embraces, so far as Mexico is concerned, only the silver coined, and it does not take into consideration the silver used in the arts, which used to be a considerable amount, as almost every well-to-do Mexican had forks, spoons, plates and other table ware and household articles of solid silver. It does not embrace either such silver as was smuggled in bullion, which, considering the large extent of the Mexican sea coast, its scanty population and the general demoralization during our civil wars represents a very large amount. It can, therefore, be safely stated that the production of silver in Mexico, not coined, represents at least from one-fourth to one-third of the amount coined. Therefore, the production of silver by Mexico may be safely estimated at from \$5,000,000,000, to \$6,000,000,000, which is about one-half of the total product of the world.

The following statement shows the amount of silver coined by the several mints of Mexico from their establishment to June 30, 1895, stating the years in which the coinage was made :

COINAGE BY THE MEXICAN MINTS FROM THEIR ESTABLISHMENT IN
1535 TO JUNE 30, 1895.

PERIOD OF COINAGE.	MINTS.	COINAGE.
1868-1895.....	Alamos.....	\$ 22,828,869
1863-1866.....	Catorce.....	1,321,545
1811-1895.....	Chihuahua.....	62,465,756
1846-1895.....	Culiacan.....	46,438,169
1811-1895.....	Durango.....	67,128,366
1812-1895.....	Guadalajara.....	64,127,846
1844-1849.....	Guadalupe y Calvo.....	4,375,062
1812-1895.....	Guanaajuato.....	307,364,150
1852-1895.....	Hermosilla.....	19,659,506
1535-1895.....	Mexico.....	2,453,110,110
1857-1893.....	Oaxaca.....	5,761,045
1827-1893.....	San Luis Potosi.....	113,143,358
1810-1812.....	Sombrerete.....	1,551,248
1827-1830.....	Tlalpam.....	1,162,660
1810-1895.....	Zacatecas.....	350,341,499
From 1535 to 1895.....	Total.....	\$3,520,779,189

I give a statement of the production of gold and silver in Mexico in the fiscal years 1879-1880, 1889-1890 and 1894-1895, which shows

a considerable increase in each of those years, and this statement only represents such amounts of the precious metals as were either exported in bullion or taken to the mints, and not the production that is otherwise disposed of.

PRODUCTION OF GOLD AND SILVER IN MEXICO IN THE FISCAL YEARS
1879-1880, 1889-1890 AND 1894-1895.

	1879-1880.			1889-1890.			1894-1895.		
	Kilo-grams.	Grams.	Value.	Kilo-grams.	Grams.	Value.	Kilo-grams.	Grams.	Value.
Gold coined.....	772	598	\$ 521,826	360	219	\$ 243,208	807	260	\$ 545,237
Gold exported.....	622	032	420,131	677	524	457,611	6,217	351	4,199,305
Total.....	1,394	630	941,957	1,037	743	700,909	7,024	611	4,744,542
Silver coined.....	587,034	804	24,018,520	594,606	526	24,328,326	675,277	551	27,628,981
Silver exported.....	74,302	310	3,040,079	362,418	697	14,828,361	747,283	490	30,575,104
Total.....	661,337	114	27,058,608	957,025	223	39,156,687	1,422,561	041	58,204,085
Total of gold and silver.....			\$28,000,565			\$39,857,596			\$62,948,627

The following statement gives the exports of the precious metals from Mexico during the same years embraced in the preceding table.

EXPORT OF PRECIOUS METALS AND MINERALS FROM MEXICO IN THE
FISCAL YEARS 1879-1880, 1889-1890 AND 1894-1895.

	VALUE IN MEXICAN DOLLARS.		
	1879-1880.	1889-1890.	1894-1895.
Argentiferous copper.....	.....	.....	.....
Gold ore.....	.....	.....	59,660
Silver ore.....	.....	6,394,662	10,935,353
Foreign gold coined.....	220,567	13,204	34,887
Mexican gold coined.....	760,683	96,592	164,113
Gold bullion.....	420,132	457,611	4,139,645
Mixed gold.....	.....	.....	.....
Foreign silver coined.....	314,537	141,033	485,326
Mexican silver coined.....	16,783,317	23,084,489	17,077,119
Base silver.....	.....	1,810	50,866
Silver bullion.....	3,040,079	7,259,959	18,803,876
Manufactured silver.....	581	.....	.....
Mixed silver.....	.....	368,872	.....
Sulphite of silver.....	.....	803,058	785,009
Argentiferous lead.....	.....	.....	.....
Argentiferous zinc.....	.....	.....	.....
	21,539,896	38,621,290	52,535,854

It may be interesting to state the amount of silver exported and coined in Mexican mints from 1874 to 1896, which is the following :

	EXPORTED.	COINED.
1874-75.....	\$ 16,038,215	\$ 19,386,958
1875-76.....	.....	19,454,054
1876-77.....	.....	21,415,128
1877-78.....	20,853,074	22,084,203
1878-79.....	19,339,151	22,162,988
1879-80.....	20,307,563	24,018,529
1880-81.....	17,774,910	24,617,395
1881-82.....	15,700,704	25,146,260
1882-83.....	28,441,212	24,083,922
1883-84.....	32,242,770	25,377,379
1884-85.....	32,770,900	25,840,728
1885-86.....	29,160,835	26,991,805
1886-87.....	32,642,785	26,844,031
1887-88.....	30,286,247	25,862,977
1888-89.....	37,982,948	26,031,223
1889-90.....	37,912,848	24,328,326
1890-91.....	35,259,131	24,237,449
1891-92.....	46,272,391	25,527,018
1892-93.....	44,303,593	27,169,876
1893-94.....	36,012,950	30,185,612
1894-95.....	36,716,870	27,628,981
1895-96.....	46,722,823	22,634,788
	\$616,741,920	\$541,029,630

The preceding statement gives correct data of the exports of silver from the fiscal year 1874-1875 to the fiscal year 1895-1896, excepting the years 1875-1876 and 1876-1877, which are not included for want of data. The difference between the two amounts for these years is \$75,712,290, showing the large proportion of silver which was not coined, and was exported in bullion.

The following statement shows that the export of Mexican silver reached almost its minimum in the year 1887-1888, and its maximum in the year 1892-1893, with the exception of the last one. The minimum coincided with the first sterling loan negotiated by Mexico ; the second sterling loan negotiated in 1890 caused a decrease in the export of Mexican silver coin of 26 per cent., as compared with the previous fiscal year of 1889-1890.

The export of silver bullion has steadily increased since 1872-1873, until it was in 1895-1896 seventeen times as large as in the first named year. During the first fiscal year of those embraced in the above table, the export of silver bullion was 1.4 to 22.6 as compared with silver coin, and in the year 1895-1896 the proportion was 15.3 to 20.5. In the year 1872-1873 the export of silver bullion represented 6 per cent. of

the total export of silver, while in the fiscal year 1895-1896 it represented 20 per cent.

The export of silver ore only began in the fiscal year 1886-1887.

EXPORTS OF SILVER FROM JULY 1ST, 1872, TO JUNE 30TH, 1896.

FISCAL YEARS.	COINS.	BULLION.	ORES.	OTHER FORMS.	TOTAL VALUE.
1872-1873.....	\$ 22,626,065	\$ 1,459,426	\$ 199,596	\$ 8,716	\$ 24,293,803
1873-1874.....	17,021,405	1,217,853	240,769	1,359	18,481,386
1874-1875.....	15,372,254	1,843,523	79,443	3,920	17,299,140
Average in three years.....	\$ 18,339,908	\$ 1,506,934	\$ 173,269	\$ 4,665	\$ 20,024,776
1877-1878.....	\$ 18,120,297	\$ 2,560,859	\$ 19,920	\$ 87	\$ 20,701,163
1878-1879.....	16,366,877	2,650,400	.....	2,812	19,020,089
1879-1880.....	16,783,317	3,040,079	.....	581	19,823,977
1880-1881.....	13,183,955	3,976,879	.....	376	17,161,210
1881-1882.....	11,607,888	3,540,894	10,129	5,079	15,163,990
Average in five years.....	\$ 15,212,467	\$ 3,153,842	\$ 6,010	\$ 1,787	\$ 18,374,086
1882-1883.....	\$ 22,969,584	\$ 4,773,928	\$ 30,105	\$ 113,537	\$ 27,892,154
1883-1884.....	25,999,876	5,311,310	67,815	111,112	31,490,113
1884-1885.....	25,394,262	5,899,297	.....	153,489	31,446,848
1885-1886.....	21,960,958	5,261,502	1,809,873	145,070	29,186,403
1886-1887.....	21,953,759	6,128,239	3,737,883	823,951	32,643,832
Average in five years.....	\$ 23,657,488	\$ 5,474,855	\$ 1,129,135	\$ 269,432	\$ 30,531,870
1887-1888.....	\$ 7,794,245	\$ 4,771,328	\$ 4,547,250	\$ 475,942	\$ 17,588,765
1888-1889.....	22,686,337	6,862,510	7,623,529	830,304	38,002,740
1889-1890.....	23,084,489	7,628,831	6,394,662	804,869	37,912,851
1890-1891.....	17,622,171	7,480,354	8,874,457	1,282,151	35,259,133
1891-1892.....	26,478,376	7,853,757	10,478,264	3,237,116	48,047,513
Average in five years.....	\$ 19,533,124	\$ 6,919,356	\$ 7,583,644	\$ 1,326,076	\$ 35,362,200
1892-1893.....	\$ 27,170,865	\$ 8,126,593	\$ 10,940,750	\$ 9,008,215	\$ 55,246,423
1893-1894.....	17,386,338	7,881,897	9,023,596	11,119,345	45,411,176
1894-1895.....	17,077,119	18,803,876	10,935,353	835,875	47,652,223
1895-1896.....	20,377,663	26,345,160	10,885,479	1,138,245	58,746,547
Average in four years.....	\$ 20,502,996	\$ 15,289,381	\$ 10,446,294	\$ 5,525,420	\$ 51,764,092
Total in the twenty-two years.....	\$ 429,047,100	\$ 143,418,595	\$ 85,898,933	\$ 30,102,151	\$ 688,471,479
Average for the twenty-two years...	\$ 19,502,140	\$ 6,519,027	\$ 3,904,496	\$ 1,368,279	\$ 31,294,158

MEXICAN GOLD EXPORTS.

Our production of gold used to be very small for reasons already given, but the present high price of that metal is increasing considerably our output of the same.

The exports of gold from Mexico in the fiscal year ended June 30, 1896, amounted to \$5,800,000, as declared by the Mexican Bureau of Statistics, but even this statement is not correct, as it needs the following additions, shown by experience and reliable authorities: about 15 per cent. for gold exports made without any return, 2 per cent. for undervaluation, 0.5 per cent. used in the arts in Mexico, 1 per cent., possibly more now, with the increasing prosperity of the country, retained in the banks, 2 per cent. in circulation, making a total of 20.5 per cent. to be added to the official return, which brings up the produc-

Mexican Gold Exported.

191

tion of gold in Mexico to \$6,989,000 for the year 1896 and even this figure is considered very low.

Mexican Gold Exported to the United States.—The United States is our principal market for the gold we produce.

The following statement furnished to me on February 6, 1897, by the Director of the Mint of the Treasury Department of the United States, contains the imports of gold bullion, ore and coin into the United States, as reported by the Collector of Customs, from 1891 to 1895, and from the fiscal years ending June 30, 1892, to June 30, 1896.

"IMPORTS OF GOLD BULLION, ORE AND COIN FROM MEXICO INTO THE UNITED STATES AS REPORTED BY COLLECTORS OF CUSTOMS.

YEARS.	ORE.	BULLION.	COIN.	TOTAL.
1891.....	\$ 222,088	\$1,192,183	\$ 367,015	\$ 1,781,286
1892.....	711,672	1,714,440	380,711	2,806,823
1893.....	507,647	1,566,728	265,315	2,339,690
1894.....	673,583	1,064,721	38,376	1,776,680
1895.....	997,221	2,435,296	34,217	3,466,734
Total.....	\$3,112,211	\$7,973,368	\$1,085,634	\$12,171,213

"For additional information see *Report on Production of Precious Metals*, 1894, page 248, and the same report for 1895, page 289.

"Yours, R. D. Preston,

"Mint Bureau, February 6, 1897."

"IMPORTS OF GOLD ORE, BULLION AND COIN FROM MEXICO INTO THE UNITED STATES AS REPORTED BY COLLECTORS OF CUSTOMS.

FISCAL YEARS ENDING JUNE 30.	ORE.	BULLION.	COIN.	TOTAL.
1892.....	\$ 246,849	\$1,336,593	\$ 542,499	\$ 2,125,941
1893.....	886,284	1,923,565	300,012	3,109,861
1894.....	502,023	1,210,757	116,823	1,829,603
1895.....	810,066	1,635,852	36,835	2,482,753
1896.....	1,108,839	2,826,327	72,482	4,007,648
Total.....	\$3,554,061	\$8,933,094	\$1,068,651	\$13,555,806

"Treasury Department, Mint Bureau, February 6, 1897."

Mr. Preston completed the above information with other data obtained from private parties in the following manner: communicated to me in a letter dated, February 6, 1897, enclosing the two preceding statements.

"I would add, for your information, that from returns received by this Bureau, from private refineries, and the deposits of foreign bullion at the Mints and Assay

Offices of the United States during the calendar years 1894 and 1895 the amount of gold credited to Mexico was reported to be as follows :

1894.	
Reported by private refineries as extracted from Mexican ores and bullion.....	\$2,360,765
Gold bullion deposited at the United States Assay Office at New York...	735,787
Deposited at the Mint at San Francisco.....	290,713
Total.....	\$3,387,265

1895.	
Gold extracted from Mexican ores and bullion by private refineries.....	\$3,843,783
Gold deposited at the United States Assay Office at New York.....	560,775
Mexican gold bullion deposited at the United States Mint at San Francisco	504,745
Total.....	\$4,909,303

The preceding official data from the United States Treasury Department was not complete, as will appear from the following table prepared by the Bureau of Statistics of the Mexican Republic :

**GOLD EXPORTED FROM MEXICO TO THE UNITED STATES.
CALENDAR YEARS.**

	1891.	1892.	1893.	1894.	1895.	1896.
Gold ore.....	\$ 16,700	\$ 100,595	\$ 113,548	\$ 5,767	\$ 87,695	\$ 324,305
Coined.....	53,769	45,290	91,936	177,089	109,421	477,505
Bullion ¹	497,400	279,699	99,415	1,606,152	4,368,898	6,851,564
Mixed ¹		126,184	257,761	144,515		528,460
Cyanide.....					31,231	31,231
Sulphite.....					3,026	3,026
According to information from Mexico.....	\$ 567,869	\$ 551,768	\$ 562,660	\$1,933,523	\$4,600,271	\$8,216,091
According to information from the United States	\$1,781,286	2,806,823	2,339,690	1,776,680	3,466,734	12,171,213
Differences.....	+ \$1,213,417	+ \$2,255,055	+ \$1,777,030	- \$ 156,843	- \$1,133,537	+ \$3,955,122
FISCAL YEARS.						
	1891-1892.	1892-1893.	1893-1894.	1894-1895.	1895-1896.	TOTAL.
Gold ore.....	\$ 31,280	\$ 145,785	\$ 55,709	\$ 8,880	\$ 160,555	\$ 402,317
Coined.....	47,259	74,798	121,915	150,544	147,981	536,497
Bullion ¹	474,156	115,642	116,994	3,687,872	4,608,959	9,003,623
Mixed ¹		271,913	256,547			528,460
Cyanide.....					80,947	80,947
Sulphite.....					31,332	31,332
According to information from Mexico.....	\$ 546,704	\$ 608,138	\$ 551,255	\$3,847,305	\$5,029,774	\$10,583,176
According to information from the United States	2,125,941	3,109,861	1,829,603	2,482,753	4,007,648	13,555,806
Differences.....	+ \$1,579,237	+ \$2,501,723	+ \$1,278,348	- \$1,364,552	- \$1,022,126	+ \$2,972,630

¹ From the 1st of July, 1894, the "Bullion" includes the value of the gold contained in the mixed ore.

This instance shows how difficult it is for the commercial statistics of both countries to agree, even when the merchandise is entered with the same value in both as in the present case.

RAILWAYS.

The following table contains a list of all the railways, exclusive of the tramways, built in Mexico up to October 31, 1896, prepared by the Department of Communications of the United Mexican States :

OFFICIAL STATEMENT MADE BY THE DEPARTMENT OF COMMUNICATIONS OF THE MEXICAN GOVERNMENT OF THE RAILROAD MILEAGE IN OPERATION ON OCTOBER 31, 1896.

(1) The initials at the beginning of each line of this table stand for the gauge of the railroads ; S. for standard, N. for narrow, and B. for both.

NAME.	DATE OF CONCESSION.	LENGTH.	FROM AND TO.
(1) S. Mexican.	Nov. 27, 1867	292.50	Mexico to Veracruz and Apizaco to Puebla.
S. Mérida to Progreso.	Jan. 17, 1874	22.65	Mérida to Progreso.
N. Hidalgo.	Feb. 2, 1878	92.43	Tepa to Sototlan, Tepa to Pachuca and San Augustin to Tepa.
B. Veracruz to Alvarado.	Mar. 26, 1878	43.75	Veracruz to Medellin and Medellin to Alvarado.
N. Mérida to Peto.	Mar. 27, 1878	68.97	Merida to Ingenio de Sta. Maria.
N. Interoceanic from Acapulco to Veracruz.	Apr. 16, 1878	489.74	Mexico to Veracruz, Mexico to Puente Ixtla by Morelos and branches of Virreyes to Libres and San Nicolas.
N. Puebla to Izucar de Matamoros.	May 6, 1878	52.39	Los Arcos to Cholula, Cholula to Atlixco and Atlixco to Matamoros.
S. Mexican Western.	Aug. 16, 1880	38.48	Culiacan to Altata.
S. Mexican Central.	Sept. 8, 1880	1,877.15	Mexico to Paso del Norte, Silao to Guanajuato, Irapuato to Guadalajara, Aguascalientes to Tampico, San Blas to Huastemba and Guadalajara to Ameca.
N. Mexican National.	Sept. 13, 1880	1,056.16	Mexico to Laredo, Acambaro to Psatzcuaro, Matamoros to S. Miguel, Mexico to Salto, belt tramways from suburbs of Mexico called La Colonia extension to Salto.
N. Mexican National Construction Company.	Sept. 13, 1880	88.30	Manzanillo to Colima and Zatecas to Ojo Caliente.
S. Sonora.	Sept. 14, 1880	262.40	Guaymas to Nogales.
N. Mérida to Valladolid.	Dec. 15, 1880	67.53	Merida to Valladolid and Progreso to Conkal.
N. Tlalmanalco.	Feb. 3, 1881	16.56	Tlalmanalco to Chalco and Amecameca.
N. Mérida to Campeche.	Feb. 23, 1881	97.80	Mérida to Campeche, Campeche to Calkini and connecting line with the railroad from Mérida to Progreso.

NAME.	DATE OF CONCESSION.	LENGTH.	FROM AND TO.
N. Campeche to Lerma.	Feb. 23, 1881	3.73	Campeche to Lerma.
S. Mexican International.	June 7, 1881	658.28	Porfirio Diaz City to Torreon and Durango, Sabinas to Hondo, Matamoros to Zaragoza, Hornos to San Pedro, branch from Velardeña and Monclova to Cuatro Ciénegas.
N. Nautla to San Marcos.	June 25, 1881	47.22	San Marcos toward Nautla and branch to Libres.
N. San Juan Bautista to Paso del Carrizal.	Sept. 17, 1881	3.57	S. Juan Bautista to Tamulte.
S. Chalchicomula.	Sept. 20, 1881	6.43	San Andres Chalchicomula.
S. Orizaba to Ingenio.	Sept. 22, 1881	4.69	Orizaba to Ingenio.
S. Santa Ana to Tlaxcala.	Dec. 11, 1882	5.28	Santa Ana to Tlaxcala.
N. Cardenas to the River Grijalva.	May 12, 1883	4.66	Cardenas to the River Grijalva.
N. Toluca to San Juan de las Huertas.	May 25, 1883	9.77	Toluca to San Juan de las Huertas.
N. Vanegas, Cedral, Matchuala and Rio Verde.	June 11, 1883	40.39	Vanegas to Cedral and branch to Potrero.
S. Tehuacan to Esperanza.	Nov. 28, 1883	31.07	Esperanza to Tehuacan.
S. Mérida to Izamal.	May 15, 1884	40.91	Mérida to Izamal.
S. Chihuahua and Hidalgo to the Sierra Madre.	Nov. 13, 1884	6.83	Chihuahua to the Sierra Madre and Jimenez to Balleza.
N. Southern Mexican.	Apr. 21, 1886	228.00	Puebla to Oaxaca.
S. Tonalá to Textila and Frontera.	Dec. 16, 1886	31.07	Tonalá to Kilomete.
S. Lower California.	May 25, 1887	16.78	San Quintin to the Colorado River.
S. Monterey to the Gulf.	Nov. 10, 1887	388.12	Monterey to Treviño and Monterey to Tampico.
N. Tecolutla to Espinal.	Dec. 10, 1887	13.04	Tecolutla to Espinal.
S. Córdova to Tuxtepec.	May 19, 1888	31.69	Córdova to Motzorongo.
S. Pachuca to Tampico.	June 5, 1888	6.21	Isolated Branch.
N. Maravatio to Cuernavaca.	Aug. 16, 1888	40.84	Maravatio towards Cuernavaca and branches to Agangueo to Trojes.
N. Mexican Northeastern.	Aug. 28, 1888	31.12	Mexico to Tizayuca.
N. Salamanca to Jaral.	Aug. 30, 1888	21.75	Salamanca to Jaral.
N. Monte Alto.	Aug. 30, 1888	6.21	Tlalnepantla to Pedregal.
N. Veracruz to Boca del Rio.	Aug. 31, 1888	13.67	Veracruz to Boca del Rio.
S. National Tehuantepec.	Government Road.	192.38	Coatzacoalcas to Salina Cruz.
S. Ometusco to Pachuca.	May 25, 1889	28.40	Ometusco to Pachuca.
S. Puebla Industrial.	July 21, 1889	22.21	Puebla to Constanica, Cholula and Huejotzingo.
S. Tula to Pachuca.	Dec. 20, 1889	43.49	Tula to Pachuca.
S. Minero.	Mar. 20, 1890	80.94	Escalon to Sierra Mojada and branches.
S. Mexico to Cuernavaca and the Pacific.	May 30, 1890	58.65	Mexico to Tres Marias and Puente de Ixtla to Mexcala.
N. Mixcalco to Santa Cruz.	June 13, 1890	2.77	Mixcalco to Santa Cruz.

NAME.	DATE OF CONCESSION.	LENGTH.	FROM AND TO.
N. Izucar of Matamoros to Acapulco.	Nov. 21, 1890	24.85	Matamoros towards Acapulco.
N. Toluca to Tenango.	Nov. 24, 1891	4.35	Toluca to Tenango.
N. Hacienda of Xavaleta to the San Rafael Paper Factory.	Mar. 24, 1892	2.49	Hacienda of Xavaleta to San Rafael Paper Mill.
S. Esperanza to Xuchil.	Nov. 29, 1892	15.84	Esperanza to Xuchil Station.
N. Guanajuato to Dolores, Hidalgo and San Luis de la Paz.	May 24, 1893	6.21	Rincon on the National Railroad to San Luis de la Paz.
S. Villa Lerdo to San Pedro de la Colonia.	June 3, 1893	15.84	Villa Lerdo to Sacramento.
N. Celaya to the farms of Roque and Plancarte.	June 2, 1893	9.07	Celaya to the farms of Roque and Plancarte.
N. From La Compañia to the Zoquiapan farm.	June 13, 1893	5.17	La Compañia to the Zoquiapan farm.
S. Cazadero to Solis.	May 24, 1893	18.64	Cazadero to point between the stations of Solis and Tepetongo.
S. Industrial Railroads.	Dec. 18, 1895	1.86	Mexico to Xochimilco.
		(x)	
	Total.....	6,791.30	

(x) This amount does not include the tramways.

RESUME OF RAILWAYS IN MEXICO IN 1895.

	KILOMETERS.	MILES.
Railroads under Federal Grants.....	10,723,k 113	6,663,022
Tramways	427, 583	265,687
Surburban Railways connecting towns.....	410, 164	254,863
Railroads belonging to private parties	87, 000	54,059
Portable Railroad, Decauville System.....	242, 252	150,527
Total.....	11,890,k 112	7,388,158

As I have already stated most of the roads built in Mexico have obtained large subsidies from the government, and that fact has contributed very materially to their present prosperous financial condition, as they have used the proceeds of the subsidy, not only to build the roads, but in some cases to pay the interest on their bonds. On the whole Mexican roads are very prosperous, and the following statements taken from the official reports of the principal roads shows their trade and earnings are increasing considerably.

The Mexican roads like the Mexican Government have been very much crippled by their obligation to pay in gold the interest on their bonds and dividends on their shares, and as they collect their freights

in silver, they have to buy gold at current prices to pay their gold obligations, and the depreciation of silver causes them a very great loss, but notwithstanding that serious drawback, the increase in their business and earnings has been such as to place them in a position to meet their gold obligations.

I give below a statement of the traffic and receipts of the three principal railways in Mexico, namely: the Mexican Central, Mexican National, and Mexican International, which I have obtained directly from the respective companies. I also give similar statements from the other roads, which I have taken from statements published by the *Anuario Estadístico de la República Mexicana* of 1895.

Mexican Central.—The Mexican Central is the largest road so far built in Mexico. The whole of the main line was opened for traffic in 1884, and all figures for traffic previous to July 1, 1884, were thrown into Construction Accounts. The annexed statement of freights and earnings of this road begins therefore in 1885, and shows a decided increase every year. I also append a statement of the traffic and earnings of this road and its branch from Tula to Pachuca, from 1881 to 1895, taken from the *Anuario Estadístico de la República Mexicana* of 1895, which has been compiled from data furnished by the company to the Mexican Government. (See first table on page 197.)

EARNINGS OF THE MEXICAN CENTRAL RAILWAY FROM 1885 TO 1896.

MEXICAN CURRENCY.

CALENDAR YEAR.	MILEAGE OPERATED.	METRIC TONS FREIGHT.	FREIGHT EARNINGS.	NUMBER OF PASSENGERS.	PASSENGER EARNINGS.	ALL OTHER EARNINGS.	TOTAL GROSS EARNINGS.
1885.....	1,235.00	226,138	\$ 2,287,410 14	512,272	\$ 1,100,268 62	\$ 171,882 00	\$ 3,559,560 76
1886.....	1,235.00	245,308	2,511,028 78	573,896	1,168,750 24	177,026 83	3,857,705 85
1887.....	1,235.00	346,898	3,458,006 46	601,393	1,235,284 05	193,288 16	4,886,578 67
1888.....	1,316.40	507,631	4,244,648 52	581,907	1,321,511 96	208,170 83	5,774,331 31
1889.....	1,461.85	540,546	4,683,200 74	675,144	1,420,375 76	233,558 88	6,337,225 38
1890.....	1,527.20	609,382	4,702,122 48	723,928	1,436,317 68	287,233 92	6,425,674 08
1891.....	1,665.11	867,657	5,625,668 51	742,993	1,470,940 51	277,999 00	7,374,598 02
1892.....	1,824.83	1,091,785	6,183,149 29	731,425	1,479,571 60	340,532 80	7,903,253 69
1893.....	1,846.64	860,187	6,130,347 06	792,025	1,443,793 73	407,627 52	7,981,768 31
1894.....	1,859.83	808,484	6,440,713 23	945,434	1,576,801 33	408,510 72	8,426,025 28
1895.....	1,859.83	1,047,038	7,145,041 44	1,030,911	1,828,072 61	522,751 63	9,495,865 68
1896.....	1,869.60	1,231,025	7,646,257 99	1,259,623	1,934,612 78	627,149 62	10,208,020 39
Total..	18,938.99	8,472,169	\$61,057,704 64	9,171,021	\$17,376,300 87	\$3,856,561 91	\$82,290,567 42

Mexican National.—The Mexican National obtained its first concession from the Mexican Government in 1877, but it was amended from time to time thereafter, until all the amended grants were grouped in the concession approved July 5, 1886, under which the road is now operated. The old companies did not print any reports, and there is no data running back further than the time when the bondholders took possession of the property at the foreclosure sale, which occurred in the City of Mexico on May 23, 1887. I give a statement of the traffic

and earnings of the road from 1873 to 1895, taken from the *Anuario Estadístico de la Republica Mexicana* in 1895, which was compiled with data furnished to the Mexican Government by the company.

CENTRAL RAILWAY AND BRANCH FROM TULA TO PACHUCA.

YEARS.	PASSEN- GERS.	PASSENGER RECEIPTS.	FREIGHT.		MISCELLANEOUS RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1881.	303,543	\$ 62,270 20	7,012	436	\$ 33,413 44	\$ 95,683 64
1882.	491,085	442,726 54	202,304	993	1,289,387 24	1,732,113 78
1883.	653,660	726,830 09	167,356	565	2,876,906 29	3,603,736 38
1884.	761,687	1,111,906 96	190,423	972	2,662,684 86	3,774,591 82
1885.	694,894	1,111,062 54	331,700	260	2,484,325 68	3,595,388 22
1886.	769,655	1,185,662 53	255,027	111	2,754,613 02	3,940,275 55
1887.	797,693	1,251,743 98	356,448	976	3,721,358 13	4,973,102 11
1888.	756,560	1,337,734 10	519,261	394	4,554,830 53	5,892,564 63
1889.	683,147	1,436,301 06	576,324	408	5,081,628 68	6,517,929 74
1890.	736,730	1,487,086 60	694,966	914	5,212,261 40	6,699,348 00
1891.	753,276	1,512,415 42	1,005,447	237	6,167,092 56	7,679,507 98
1892.	735,363	1,442,310 99	1,100,364	029	6,534,507 42	7,976,818 41
1893.	792,025	1,443,793 73	860,186	545	6,537,974 58	7,981,768 31
1894.	945,434	1,576,801 35	898,484	071	6,849,223 95	8,426,025 30
1895.	1,030,911	1,828,072 61	1,047,037	836	7,767,793 03	9,595,865 64
Total	10,906,572	\$17,956,718 70	8,212,346	747	\$64,528,000 81	\$82,484,719 51

MEXICAN NATIONAL RAILROAD.

YEARS.	PAS- SENGERS.	PASSENGER RECEIPTS.	FREIGHT.		MISCEL- LANEOUS RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1873.	247,547	\$ 17,425 65	.....	.....	.....	\$ 17,425 65
1874.	584,075	40,446 01	298	860	298 86	40,744 87
1875.	486,788	43,027 18	221	140	221 14	43,248 32
1876.	486,000	43,437 24	698	245	709 41	44,146 65
1877.	565,572	52,759 84	346	499	275 75	53,035 59
1878.	529,333	71,193 68	3,209	097	3,845 61	75,039 29
1879.	535,806	74,277 07	8,102	920	15,329 07	89,606 14
1880.	466,897	91,505 23	18,191	400	41,983 90	133,489 13
1881.	903,049	124,452 13	26,234	150	47,320 00	171,772 13
1882.	900,855	225,267 21	105,549	146	229,586 51	454,853 72
1883.	1,071,835	341,614 87	140,185	779	366,320 26	707,935 13
1884.	878,878	517,316 80	254,804	000	743,423 74	1,260,740 54
1885.	839,573	492,822 92	177,179	000	803,291 20	1,296,114 12
1886.	891,711	538,359 97	132,661	000	1,018,018 51	1,556,378 48
1887.	884,541	537,520 17	307,435	000	1,120,950 34	1,658,470 51
1888.	907,113	691,915 03	370,300	527	1,880,684 24	2,572,599 27
1889.	929,685	864,309 90	430,166	055	2,640,418 14	3,504,728 04
1890.	937,527	887,437 19	487,598	563	2,684,550 59	3,561,987 78
1891.	998,617	994,951 69	515,164	143	3,057,891 00	4,052,842 69
1892.	1,012,786	973,768 72	605,545	610	3,643,784 47	4,617,553 19
1893.	935,167	972,488 57	571,524	780	3,191,146 37	4,163,634 94
1894.	576,574	865,698 53	527,440	000	3,246,375 07	4,112,073 60
1895.	926,516	1,005,515 55	642,535	071	3,426,841 93	4,432,357 48
Total	17,496,445	\$10,467,511 15	5,325,390	985	\$28,152,266 11	\$38,609,777 26

STATEMENT OF EARNINGS AND EXPENSES OF THE MEXICAN NATIONAL RAILWAY, FROM 1889 TO 1896 INCLUSIVE.
ROAD OPENED FOR THROUGH TRAFFIC IN NOVEMBER, 1888.
MEXICAN CURRENCY.

EARNINGS FROM	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.
Freight.....	\$2,612,509 38	\$2,654,208 04	\$2,956,817 91	\$3,474,405 42	\$2,956,148 19	\$3,087,466 29	\$3,129,461 43	\$3,871,117 08
Passenger and Mail.....	869,133 94	902,023 41	1,020,627 10	994,071 43	985,399 34	924,454 28	1,010,047 75	1,010,150 14
Express.....	127,822 31	129,151 00	156,670 31	179,623 45	199,730 71	227,939 76	262,014 13	278,138 62
Telegraph.....	17,715 31	20,509 92	23,358 12	24,738 14	22,305 98	25,834 93	34,775 78	58,318 06
Miscellaneous.....	32,943 30	49,073 99	48,949 30	83,191 50	61,219 89	63,383 39	76,906 82	81,301 87
Total.....	\$3,660,124 24	\$3,754,966 36	\$4,206,422 74	\$4,756,029 94	\$4,224,804 11	\$4,329,078 65	\$4,513,205 91	\$5,299,025 77
Operating Expenses.....	2,993,431 54	2,927,961 89	3,047,401 56	3,055,416 55	2,586,366 45	2,437,116 41	2,441,797 41	2,773,068 06
Net Earnings.....	666,692 70	827,004 47	1,159,021 18	1,700,613 39	1,638,437 66	1,891,962 24	2,071,408 50	2,525,957 71
Per cent. of Earnings for Operation.....	81 78	77 97	72 45	64 24	61 22	56 30	54 10	52 33
Expenditure for Extraordinary Repairs and Replacements.....	.....	135,194 15	419,955 87	149,080 83	151,612 22	93,451 32	121,534 70	156,586 37
Gold Purchases taken up in Exchange Account.....	25,887 88	18,338 25	64,745 18	310,777 59	542,802 54	885,149 80	861,681 42	991,760 43

I also append a statement of the freights, passengers, express, telegraphs, and miscellaneous receipts, as well as the expenses and earnings of the road from the year 1889 to 1896, taken from the last official report of the companies. It will be noticed that the traffic and receipts of this road, like the Central, have been steadily increasing from the time at which it began to be operated. (See table on page 198.)

MEXICAN INTERNATIONAL RAILROAD COMPANY. GROSS EARNINGS IN MEXICAN MONEY.

YEAR.	NO. OF PASS'G'RS.	PASSENGER RECEIPTS.	FREIGHT.		FREIGHT RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
From Dec. 3d, 1883- 1884.	15,942	\$ 32,408 45	15,129	723	\$ 37,575 00	\$ 69,983 45
1885.						
1886.	9,853	25,881 44	50,896	181	118,177 80	144,059 24
1887.	10,411	29,242 61	55,877	079	144,311 09	173,553 70
1888.	9,796	32,516 71	86,889	772	189,184 86	221,701 57
1889.	41,170	125,848 48	116,561	273	459,906 57	585,755 05
1890.	53,194	140,676 05	180,544	270	691,477 04	832,153 09
1891.	59,327	149,258 43	222,856	211	894,944 35	1,044,202 78
1892.	64,641	170,304 00	216,465	739	956,546 91	1,126,850 91
1893.	60,967	181,378 14	390,802	838	1,836,958 51	2,018,336 65
1894.	74,577	219,624 38	335,200	769	1,743,140 42	1,962,764 80
1895.	77,456	208,551 86	376,734	430	1,873,974 91	2,082,526 77
1896.	102,858	276,514 04	469,641	859	2,197,463 36	2,473,977 40
1896.	111,480	313,904 13	525,951	874	2,453,223 54	2,767,127 67
Total..	691,672	\$1,906,108 72	3,043,552	018	\$13,596,884 36	\$15,502,993 08

MEXICAN INTERNATIONAL RAILWAY. (STATEMENT FURNISHED BY THE COMPANY.)

YEAR.	AVERAGE KILOMETRES OPERATED.	GROSS EARNINGS.	AVERAGE EARNINGS PER KILOMETRE.	AVERAGE EARNINGS PER MILE.
1884.	245.20	\$ 103,307 98	\$ 421 49	\$ 612 37
1885.	273.58	153,916 18	562 59	905 39
1886.	273.58	185,150 25	676 76	1,098 11
1887.	273.58	237,394 13	867 73	1,396 43
1888.	573.97	656,781 41	1,144 28	1,841 47
1889.	636.34	911,698 51	1,432 73	2,305 64
1890.	637.38	1,126,366 41	1,745 64	2,839 77
1891.	658.30	1,197,856 55	1,819 69	2,924 02
1892.	746.37	2,095,726 14	2,807 89	4,518 67
1893.	922.19	2,050,934 01	2,226 15	3,579 04
1894.	922.19	2,169,121 47	2,352 14	3,785 29
1895.	947.23	2,664,126 08	2,812 54	4,526 28
1896.	1,011.02	2,900,925 33	2,869 30	4,617 69
Total.	8,120.93	\$16,453,304 45	\$21,738 93	\$34,950 17

Mexican International. The Mexican International, which has been built without any subsidy from the Mexican Government, was opened for traffic in 1883, and its traffic and receipts, like the other two roads, have steadily increased. I append two statements of this road; the

first, furnished me by the company, embraces its traffic and earnings from 1883 to 1896; and the second is another statement furnished me also by the company, showing the average kilometres operated, gross earnings, average earnings per kilometre, and average earnings per mile from the years 1884 to 1896. (See the two tables on page 199.)

Mexican Southern Railway.—I give below a statement of the number of passengers, amount of freight and earnings of the Mexican Southern Railway, furnished to me by the Company, embracing nine months of the year 1893 and the whole of 1894, as before the 1st of April, 1893, the road was run by the Contractors, and the Company has no data in their possession. I also append a statement taken from the *Anuario Estadístico de la Republica Mexicana* of 1895, embracing the traffic and

MEXICAN SOUTHERN RAILWAY.

MONTHS.	PASSEN- GERS.	PASSENGER RECEIPTS.	FREIGHT.		FREIGHT RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1893.						
January						
February						
March						
April	12,099	\$ 14,647 21	2,554	810	\$ 20,243 01	\$ 38,172 41
May	9,943	11,683 15	2,262	790	15,421 87	29,506 27
June	8,154	7,119 78	1,344	950	9,541 00	18,209 89
July	11,865	8,740 20	1,355	420	5,707 05	16,671 95
August	10,375	9,577 91	2,568	330	23,762 64	35,959 30
September ...	10,405	9,751 47	2,019	000	17,322 40	30,947 32
October	10,897	10,317 54	2,145	150	16,941 41	29,945 71
November ...	11,893	12,661 99	3,296	070	16,276 89	31,839 26
December ...	14,452	17,096 43	2,943	420	15,702 01	38,308 76
Total	100,083	\$101,595 68	20,489	940	\$140,918 28	\$269,560 87

Number of Passengers according to official Tables..... 142,919.

“ Tons “ “ “ 27,917,510 k.

MONTHS.	PASSEN- GERS.	PASSENGER RECEIPTS.	FREIGHT.		FREIGHT RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1894.						
January	15,255	\$ 16,146 67	3,187	880	\$ 20,083 75	\$ 39,725 34
February	14,900	14,925 48	3,060	140	22,616 16	40,935 29
March	29,545	21,348 92	3,744	290	25,224 36	50,001 11
April	16,527	17,195 80	4,010	380	25,184 73	45,742 46
May	18,229	14,864 75	4,322	880	21,406 14	39,720 18
June	20,543	15,173 98	3,942	590	23,279 97	42,037 56
July	19,471	14,023 23	3,828	110	20,637 28	38,168 24
August	18,218	14,602 85	3,515	420	17,531 15	35,709 56
September ...	18,653	15,354 80	3,189	740	16,285 34	35,156 99
October	17,814	14,954 13	2,973	510	19,374 02	38,068 95
November ...	16,300	14,257 08	2,453	800	17,145 58	34,691 02
December ...	20,994	18,776 23	2,682	690	17,900 02	40,519 83
Total	226,449	\$191,624 01	40,911	430	\$246,668 50	\$480,476 53

Railways.

201

earnings of the Company during the years from 1890 to 1895, taken from data furnished by the Company to the Department of Communications of Mexico.

MEXICAN SOUTHERN.

YEARS.	PASSEN- GERS.	PASSENGER RECEIPTS.	MERCHANDISE.		OTHER RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1890.....						
1891.....	76,788	\$74,259 78	11,506	820	\$ 59,427 26	\$ 133,687 04
1892.....	104,296	109,011 90	26,977	490	152,859 11	261,871 01
1893.....	143,037	153,233 01	27,921	510	246,862 75	400,095 76
1894.....	225,447	191,624 01	40,911	430	246,668 50	438,292 51
1895.....	218,213	196,462 34	36,511	210	287,426 59	483,888 93
Total.....	767,781	\$724,591 04	143,828	460	\$993,244 21	\$1,717,835 25

Other Railroads. The following statement shows the traffic and earnings of the Mexican, Interoceanic, Sonora, and minor railroads in Mexico, taken from the *Anuario Estadístico de la República Mexicana* of 1895, compiled from data furnished by the respective companies to the Department of Communications of the Mexican Government.

MEXICAN RAILROAD.

YEARS.	PASSEN- GERS.	PASSENGER RECEIPTS.	MERCHANDISE.		OTHER RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1873...	476,287	\$482,565 39	150,473	812	\$ 1,348,344 49	\$ 1,830,909 88
1874...	459,601	467,816 73	121,935	229	1,887,028 76	2,354,845 49
1875...	267,776	476,546 91	136,632	65	1,970,008 55	2,446,555 46
1876...	245,675	380,018 73	132,216	831	1,841,717 53	2,221,736 26
1877...	300,591	533,520 58	158,537	56	2,255,466 03	2,788,986 61
1878...	279,893	518,318 74	169,287	672	2,440,513 39	2,958,832 13
1879...	293,179	517,711 92	190,908	638	2,823,013 02	3,340,724 94
1880...	323,088	548,941 72	219,930	162	3,242,343 11	3,791,284 83
1881...	331,749	587,135 85	278,942	924	4,433,648 24	5,020,784 09
1882...	385,621	696,235 87	333,979	556	5,396,090 55	6,092,326 42
1883...	409,098	710,636 88	373,389	634	5,115,639 84	5,826,276 72
1884...	389,421	655,458 83	236,030	480	3,191,916 10	3,847,374 93
1885...	377,512	603,886 11	246,169	949	2,812,764 22	3,416,650 33
1886...	367,260	604,278 41	266,432	333	2,714,082 96	3,318,361 37
1887...	380,153	655,312 23	301,185	300	3,141,903 40	3,797,215 63
1888...	393,679	694,138 08	351,070	36	3,352,439 37	4,046,577 45
1889...	444,149	765,118 71	391,627	274	3,512,566 64	4,277,685 35
1890...	502,139	701,916 00	443,794	979	3,565,083 50	4,266,999 50
1891...	620,988	832,185 94	464,123	453	3,239,764 53	4,071,950 47
1892...	628,591	797,878 35	408,709	417	2,286,389 71	3,084,268 06
1893...	629,892	768,616 68	387,400	277	2,140,061 75	2,908,678 43
1894...	717,076	857,525 26	433,637	485	2,063,486 26	2,921,011 52
1895...	772,139	993,016 63	453,294	579	2,087,844 19	3,080,860 82
Total.	9,995,557	\$14,848,780 55	6,649,709	141	\$66,862,116 14	\$81,710,896 69

Statistical Notes on Mexico.

INTEROCEANIC RAILWAY.

YEARS.	PASSENGERS.	PASSENGER RECEIPTS.	MERCHANDISE.		OTHER RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1880.....	228,053	\$65,277 91	11,431	145	\$ 36,515 46	\$ 101,793 37
1881.....	367,116	105,083 31	49,942	548	159,535 64	264,618 95
1882.....	411,090	111,029 25	53,382	385	258,221 05	369,250 30
1883.....	406,016	223,049 58	56,822	222	356,906 46	579,956 04
1884.....	634,306	247,528 50	131,385	319	407,593 64	655,122 14
1885.....	606,510	240,233 70	167,970	265	436,345 10	676,578 80
1886.....	569,421	224,815 19	148,001	913	482,003 18	706,818 37
1887.....	621,295	239,812 48	174,194	156	570,033 20	809,845 68
1888.....	673,169	254,809 77	200,386	400	658,063 22	912,872 99
1889.....	596,812	271,562 69	190,902	920	710,848 78	982,411 47
1890.....	657,616	383,107 10	288,836	358	1,153,999 13	1,537,106 23
1891.....	795,625	456,685 80	282,311	491	1,176,562 22	1,633,248 02
1892.....	799,487	466,799 31	367,762	660	1,376,488 38	1,843,287 69
1893.....	879,005	486,075 54	383,503	000	1,705,859 74	2,191,935 28
1894.....	881,810	491,914 20	440,648	000	1,912,192 58	2,404,106 78
1895.....	906,550	491,388 67	464,975	000	1,771,268 92	2,262,657 59
Total ..	10,033,881	4,759,173 00	3,412,455	782	13,172,436 70	17,931,609 70

SONORA RAILWAY.

1881.....	.....	\$ 11,303 29	.....	.....	\$ 17,254 95	\$ 28,558 24
1882.....	.....	68,410 83	.....	.....	157,694 60	226,105 43
1883.....	33,464	99,461 33	24,202	791	119,347 56	218,808 89
1884.....	36,428	87,793 47	21,115	382	108,531 43	196,324 90
1885.....	47,271	101,918 90	29,927	682	193,189 89	295,108 79
1886.....	45,298	98,613 06	33,635	621	191,981 24	290,594 30
1887.....	38,189	87,098 20	34,660	670	193,981 40	281,079 60
1888.....	38,335	84,143 57	37,621	60	204,146 63	288,290 20
1889.....	44,691	104,367 85	43,321	710	239,697 67	344,065 52
1890.....	48,196	97,662 48	46,147	870	259,360 01	357,022 49
1891.....	56,565	112,919 18	53,947	663	332,938 65	445,857 83
1892.....	54,621	119,784 37	58,867	359	363,128 91	482,913 28
1893.....	52,678	126,657 56	63,687	055	393,319 17	519,976 73
1895.....	62,715	141,744 09	69,982	389	469,950 09	611,694 18
Total ..	558,451	1,341,878 18	517,117	252	3,244,522 20	4,586,400 38

HIDALGO AND NORTHEASTERN RAILWAY.

1881.....	39,759	\$ 9,897 17	2,264	000	\$ 1,659 36	\$ 11,556 53
1882.....	30,940	12,270 02	7,624	000	10,442 30	22,712 32
1883.....	37,198	25,715 04	17,852	283	33,220 80	58,933 84
1884.....	35,209	32,648 22	34,958	222	54,955 16	87,603 38
1885.....	51,823	32,295 08	40,960	794	76,710 43	109,005 51
1886.....	44,666	36,692 27	51,760	395	117,603 55	154,295 82
1887.....	53,958	43,582 66	65,524	057	145,702 22	189,284 88
1888.....	55,055	45,805 05	77,203	173	161,773 18	207,578 23
1889.....	90,241	90,194 56	100,110	733	262,081 27	352,275 83
1890.....	113,605	106,397 87	137,467	201	328,124 49	434,522 36
1891.....	127,972	120,128 18	176,432	664	404,735 74	524,863 92
1892.....	148,540	141,360 09	186,041	471	422,052 91	563,413 00
1893.....	168,422	161,908 45	178,174	047	468,566 69	630,475 14
1894.....	214,837	178,477 10	200,685	687	643,700 93	822,178 03
1895.....	206,194	181,043 96	164,176	000	616,641 61	797,685 57
Total ..	1,418,419	\$1,218,415 72	1,441,234	727	\$3,747,970 64	\$4,966,384 36

Railways.

203

MÉRIDA AND PROGRESO RAILWAY.

YEARS.	PASSENGERS.	PASSENGER RECEIPTS.	MERCHANDISE.		OTHER RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1881.....	56,085	\$ 28,639 50	.....	.....	\$ 53,236 00	\$ 81,875 50
1882.....	84,016	37,642 38	41,934	297	75,242 88	112,885 26
1883.....	83,231	36,239 83	59,859	715	108,248 80	144,488 63
1884.....	87,159	37,940 54	95,962	902	139,299 59	177,240 13
1885.....	64,173	29,078 41	79,611	737	120,389 13	149,407 54
1886.....	77,139	33,353 16	58,239	254	78,168 66	111,521 82
1887.....	85,044	22,844 42	46,055	714	52,995 68	75,840 10
1888.....	109,997	29,812 76	30,872	512	64,291 88	94,104 64
1889.....	158,534	56,763 81	44,619	200	97,017 37	153,781 18
1890.....	162,701	55,566 97	53,949	818	89,139 81	144,706 78
1891.....	129,989	46,155 85	34,486	000	67,460 18	113,616 03
1892.....	108,119	36,528 45	28,656	499	83,593 75	120,132 20
1893.....	91,291	39,276 08	34,406	476	96,230 47	135,506 55
1894.....	79,653	33,387 18	38,659	401	68,513 05	101,900 23
1895.....	.....	38,228 81	.....	.....	97,850 38	136,079 19
Total...	1,377,131	\$561,458 15	647,313	525	\$1,291,677 63	\$1,853,135 78

TEHUACAN AND ESPERANZA RAILWAY.

1884.....	18,343	\$ 11,427 64	6,043	813	\$ 32,921 87	\$ 44,349 51
1885.....	15,049	10,077 20	5,857	257	31,905 66	41,982 86
1886.....	12,942	9,111 04	6,603	705	38,271 80	47,382 84
1887.....	14,848	10,080 15	7,669	730	47,437 77	57,517 92
1888.....	17,116	15,376 57	8,764	045	54,500 93	69,877 50
1889.....	19,385	20,673 00	9,858	360	61,564 09	82,237 09
1890.....	20,462	18,459 96	16,625	870	75,744 37	94,204 33
1891.....	17,426	11,087 06	14,381	340	68,684 08	79,771 14
1892.....	15,102	8,792 35	4,179	510	44,602 09	53,394 44
1893.....	16,096	9,411 51	5,663	530	37,997 45	47,408 96
1894.....	.....	.....	.....	.....	.....	.....
1895.....	19,905	10,941 81	4,062	500	18,724 99	29,666 80
Total...	186,674	\$135,438 29	89,709	660	\$512,355 10	\$647,793 39

MÉRIDA AND PETO RAILWAY.

1881.....	22,852	\$ 3,913 69	.....	.....	\$ 430 60	\$ 4,344 29
1882.....	81,102	12,293 58	.....	.....	2,637 41	14,930 99
1883.....	88,920	14,422 31	5,654	115	4,833 23	19,255 54
1884.....	81,566	17,818 29	11,063	915	11,588 49	29,406 78
1885.....	64,118	16,795 70	16,919	464	20,222 10	37,017 80
1886.....	62,983	16,728 82	17,368	079	21,710 91	38,439 73
1887.....	62,763	15,943 55	15,827	969	26,619 71	42,563 26
1888.....	92,773	22,146 61	20,231	714	37,013 76	59,160 37
1889.....	99,761	25,351 70	25,397	822	52,553 95	77,905 65
1890.....	126,978	24,514 70	30,024	477	69,390 02	93,904 72
1891.....	134,438	55,007 97	27,106	666	85,602 24	140,610 21
1892.....	129,163	59,742 62	28,266	475	118,214 20	177,956 82
1893.....	163,852	71,970 64	36,202	439	128,115 61	200,086 25
1894.....	157,311	70,898 03	32,260	765	121,547 79	192,445 82
1895.....	140,193	67,134 69	37,853	723	118,179 11	185,313 80
Total...	1,508,773	\$494,682 90	304,177	623	\$818,659 13	\$1,313,342 03

Statistical Notes on Mexico.

SINALOA AND DURANGO (ALTATA TO CULIACAN) RAILWAY.

YEARS.	PASSENGERS.	PASSENGER RECEIPTS.	FREIGHT.		MISCELLANEOUS RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1882.....	2,727	\$ 3,712 04	1,864	589	\$ 5,155 65	\$ 8,867 69
1883.....	12,251	7,816 94	3,913	457	18,717 39	26,534 33
1884.....	21,776	8,584 57	5,962	325	25,019 62	33,604 19
1885.....	15,816	8,786 88	4,953	304	19,719 92	28,506 80
1886.....	23,171	10,681 46	4,316	116	20,880 39	31,561 85
1887.....	25,487	10,705 56	5,962	325	16,661 71	27,367 27
1888.....	27,904	11,459 15	6,736	532	23,650 34	35,109 49
1889.....	21,850	9,318 46	6,535	236	25,537 79	34,856 25
1890.....	42,987	14,871 77	4,722	749	18,911 41	33,783 18
1891.....	54,678	19,170 23	7,442	886	25,381 35	44,551 58
1892.....	39,494	14,837 39	10,371	701	28,131 17	42,968 56
1893.....	56,503	14,152 07	12,893	822	35,205 12	49,357 19
1894.....	38,451	14,040 41	12,093	568	38,393 29	52,433 70
1895.....	37,627	15,768 25	8,538	024	29,390 59	45,158 84
Total...	420,722	\$163,905 18	96,306	694	\$330,755 74	\$494,660 92

MÉRIDA AND CAMPECHE RAILWAY.

1883.....	22,944	\$ 3,586 10	462	169	\$ 1,120 32	\$ 4,706 42
1884.....	97,295	13,161 59	3,952	565	5,203 67	18,365 26
1885.....	76,135	12,535 94	7,794	570	9,306 31	21,842 25
1886.....	65,274	10,779 44	6,265	722	9,579 90	20,359 34
1887.....	68,883	11,793 63	8,106	813	13,263 22	25,056 85
1888.....	86,329	22,172 11	11,514	018	21,106 70	43,278 81
1889.....	58,383	17,017 46	12,534	035	28,300 44	45,317 90
1890.....	75,496	28,939 04	6,779	458	19,057 69	47,996 73
1891.....	96,994	35,303 04	17,328	478	36,035 70	71,338 74
1892.....	87,954	33,598 11	17,363	510	39,330 26	72,928 37
1893.....	124,983	56,034 03	21,775	101	53,390 97	109,425 00
1894.....	.....	.....	.....	.....	.....	.....
1895.....	139,349	66,174 14	24,699	277	72,923 31	139,097 45
Total...	1,000,019	\$311,094 63	138,575	716	\$308,618 49	\$ 619,713 12

MÉRIDA AND VALLADOLID RAILWAY.

1883.....	18,123	\$ 2,570 17	.....	.....	\$ 609 18	\$ 3,179 35
1884.....	75,541	12,595 63	4,248	788	5,287 96	17,883 59
1885.....	100,015	18,548 61	6,040	957	8,487 63	27,036 24
1886.....	132,210	25,798 73	25,181	498	33,276 45	59,075 18
1887.....	176,501	32,298 87	41,496	479	58,006 41	90,395 28
1888.....	183,973	37,957 45	35,975	207	65,864 26	103,821 71
1889.....	280,348	58,691 70	54,206	189	115,032 74	173,724 44
1890.....	295,034	63,485 18	50,781	662	96,611 23	160,096 41
1891.....	264,781	60,366 76	47,064	535	98,212 31	158,579 07
1892.....	254,344	61,573 70	46,124	159	134,209 85	195,783 55
1893.....	244,040	79,223 48	50,633	534	139,384 68	218,608 16
1894.....	.....	.....	.....	.....	.....	.....
1895.....	199,670	72,828 22	62,342	134	165,983 26	238,811 48
Total...	2,224,580	\$525,938 50	424,095	142	\$921,055 96	\$1,446,994 46

TLALMANALCO RAILWAY.

YEARS.	PASSENGERS.	PASSENGER RECEIPTS.	FREIGHT.		MISCELLANEOUS RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1883.....	39,688	\$ 4,022 44	10,813	000	\$ 5,564 91	\$ 9,587 35
1884.....	40,211	4,596 80	9,641	000	7,276 95	11,873 75
1885.....	41,226	4,577 43	7,466	713	6,830 06	11,407 49
1886.....	41,905	4,621 28	6,845	349	6,360 51	10,981 79
1887.....	47,808	5,098 09	8,083	538	6,788 75	11,886 84
1888.....	46,150	5,076 07	10,722	122	9,164 56	14,241 53
1889.....	49,866	5,536 16	13,710	170	11,566 53	17,102 69
1890.....	55,345	6,654 20	24,988	131	12,019 62	18,673 82
1891.....	61,236	6,765 86	15,469	050	12,684 68	19,450 54
1892.....	62,618	7,225 65	12,303	020	9,853 83	17,079 48
1893.....	60,835	6,492 30	18,572	715	15,430 59	21,922 89
1894.....	.....	.....	.....	.....	.....	.....
1895.....	71,777	7,358 10	13,824	250	12,284 66	19,642 76
Total...	618,665	\$68,025 28	152,439	058	\$115,825 65	\$183,850 93

SAN JUAN BAUTISTA AND CARRIZAL PASSENGER RAILWAY.

1888.....	99,504	\$ 5,123 13	.....	.....	.....	\$ 5,123 13
1889.....	56,880	4,406 10	.....	.....	.....	4,406 10
1890.....	110,731	6,733 92	1,022	000	\$1,022 60	7,756 52
1891.....	105,251	7,923 34	922	000	922 79	8,846 13
1892.....	152,606	9,462 23	1,803	000	1,442 28	10,904 51
1893.....	150,243	9,965 56	2,052	000	1,842 70	11,808 26
1894.....	.....	.....	.....	.....	.....	.....
1895.....	167,994	12,003 21	3,455	454	3,131 00	15,134 21
Total...	843,209	\$55,617 49	9,254	454	\$8,361 37	\$63,978 86

SAN ANDRÉS AND CHALCHICOMULA RAILWAY.

1882.....	6,851	\$ 1,905 53	1,658	614	\$ 2,847 76	\$ 4,753 29
1883.....	15,053	4,002 51	4,802	280	9,548 51	13,551 02
1884.....	14,218	3,683 23	4,485	960	11,681 15	15,364 38
1885.....	10,928	2,834 42	4,723	310	4,805 87	7,640 29
1886.....	9,994	2,595 58	4,079	294	4,980 84	7,576 42
1887.....	9,794	2,428 25	5,835	696	6,850 94	9,279 19
1888.....	10,173	2,489 80	8,324	735	9,592 88	12,082 68
1889.....	12,727	3,137 07	5,832	417	7,100 57	10,237 64
1890.....	13,010	3,163 15	4,385	480	6,225 35	9,388 50
1891.....	12,711	3,079 10	6,258	307	8,140 76	11,219 86
1892.....	12,223	6,327 21	7,980	430	9,376 67	15,703 88
1893.....	12,239	3,061 75	10,011	250	11,474 05	14,535 80
1894.....	13,998	3,398 65	7,781	980	9,266 42	12,665 07
1895.....	13,454	3,444 35	.....	.....	10,383 00	13,827 35
Total...	167,373	\$45,550 60	76,159	753	\$112,274 77	\$157,825 37

Statistical Notes on Mexico.

ORIZABA AND INGENIO RAILWAY.

YEARS.	PASSEN- GERS.	PASSENGER RECEIPTS.	FREIGHT.		MISCELLA- NEOUS RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1882.....	38,636	\$ 4,473 30	.....	.....	\$ .....	\$ 4,473 30
1883.....	91,949	10,645 94	237	168	197 64	10,843 58
1884.....	94,323	10,920 74	360	972	300 82	11,221 56
1885.....	34,921	4,365 12	435	720	363 10	4,728 22
1886.....	86,047	9,962 57	384	813	350 18	10,312 75
1887.....	40,364	4,673 38	121	344	101 12	4,774 50
1888.....	41,945	4,800 00	182	400	152 00	4,952 00
1889.....	46,640	5,400 00	168	000	140 00	5,540 00
1890.....	106,773	12,362 20	504	000	420 00	12,782 20
1891.....	103,011	12,532 10	612	000	510 00	13,042 10
1892.....	99,553	13,303 20	750	000	728 36	14,031 56
1893.....	104,030	13,900 50	.....	.....	400 00	14,300 50
1894.....	104,019	13,990 77	704	000	528 00	14,518 77
1895.....	132,650	17,438 04	748	000	561 00	17,999 04
Total..	1,124,861	\$138,767 86	5,208	417	\$4,752 22	\$143,520 08

SANTA ANA AND TLAXCALA RAILWAY.

1883.....	58,068	\$ 2,860 20	.....	.....	\$ 494 38	\$ 3,354 58
1884.....	117,560	8,580 60	.....	.....	1,494 14	10,074 74
1885.....	174,204	12,714 98	.....	.....	1,483 00	14,197 98
1886.....	156,676	6,733 14	.....	.....	1,482 37	8,215 51
1887.....	117,518	8,463 85	.....	.....	1,373 25	9,837 10
1888.....	120,910	9,179 28	.....	.....	1,651 02	10,830 30
1889.....	110,574	8,294 98	.....	.....	1,475 20	9,770 18
1890.....	145,263	8,398 00	.....	.....	1,469 82	9,867 82
1891.....	66,716	9,098 30	.....	.....	1,769 28	10,867 58
1892.....	55,768	7,011 74	750	000	1,280 03	8,291 77
1893.....	59,127	7,326 40	3,829	003	2,434 13	9,760 53
1894.....	.....	.....	.....	.....	.....	.....
1895.....	71,843	8,670 35	2,038	440	2,344 38	11,014 73
Total..	1,254,227	\$ 97,331 82	6,617	443	\$18,751 00	\$116,082 82

CÁRDENAS AND RIO GRIJALVA RAILWAY.

1886.....	.....	\$ 263 01	.....	.....	\$ 526 00	\$ 789 01
1887.....	.....	401 43	.....	.....	722 57	1,124 00
1888.....	.....	309 07	.....	.....	781 13	1,090 20
1889.....	.....	216 72	.....	.....	839 69	1,056 41
1890.....	.....	380 00	.....	.....	839 69	1,219 69
1891.....	.....	480 00	.....	.....	939 69	1,419 69
1892.....	.....	.....	.....	.....	.....	.....
1893.....	.....	.....	.....	.....	.....	.....
1884.....	.....	.....	.....	.....	.....	.....
1895.....	.....	.....	.....	.....	.....	.....
Total..	.....	2,050 23	.....	.....	\$4,648 77	\$6,699 00

TOLUCA AND SAN JUAN DE LAS HUERTAS RAILWAY

YEARS.	PASSENGERS.	PASSENGER RECEIPTS.	FREIGHT.		MISCELLANEOUS RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1885.....	75,052	\$ 7,016 39	.....	....	\$ 1,138 19	\$ 8,154 58
1886.....	97,535	9,078 95	6,133	000	5,201 59	14,280 54
1887.....	94,874	8,788 61	9,361	000	6,755 49	15,544 10
1888.....	93,512	8,475 83	7,251	750	4,729 99	13,205 82
1889.....	134,193	12,677 97	13,483	088	8,087 03	20,765 00
1890.....	178,072	16,264 75	18,595	861	12,156 67	28,421 42
1891.....	156,917	15,293 69	13,998	185	11,082 76	26,376 45
1892.....	107,122	13,777 47	13,924	530	11,702 56	25,480 03
1893.....	176,241	16,340 90	14,128	510	11,690 24	28,031 14
1894.....	121,949	15,328 76	13,778	920	11,536 10	26,864 86
1895.....	204,591	18,210 13	13,860	796	10,136 78	28,346 91
Total..	1,440,058	\$141,253 45	124,515	640	\$94,217 40	\$235,470 85

VANEGAS, CEDRAL, MATEHUALA, AND RIO VERDE RAILWAY.

1889.....	.....	\$ 449 69	28	540	\$ 335 24	\$ 784 93
1890.....	10,848	5,763 16	1,840	661	15,492 27	21,255 43
1891.....	36,742	12,783 05	5,939	568	61,513 43	74,296 48
1892.....	44,502	16,083 11	94,112	500	124,565 69	140,648 80
1893.....	46,083	16,030 02	83,115	000	114,505 49	130,535 51
1894.....	35,213	13,798 53	113,384	000	185,649 51	199,448 04
1895.....	.....	.....	.....	.....	.....	.....
Total..	173,388	\$64,907 56	298,420	269	\$502,061 63	\$566,969 19

MÉRIDA AND IZAMAL RAILWAY.

1887.....	42,812	\$ 7,280 38	2,729	000	\$ 3,954 64	\$ 11,235 02
1888.....	78,102	18,981 70	7,871	541	17,056 81	36,038 51
1889.....	106 089	38,330 34	11,633	376	28,069 91	66,400 25
1890.....	106,883	54,462 10	10,146	374	29,995 33	84,457 43
1891.....	80,042	41,891 51	13,775	771	44,798 43	86,689 94
1892.....	94,634	49,729 03	18,094	768	65,565 47	115,294 50
1893.....	96,458	45,684 12	21,476	676	65,714 14	111,398 26
1894.....	.....	52,564 78	.....	.....	61,335 45	113,900 23
1895.....	.....	49,735 12	.....	.....	63,295 49	113,030 61
Total..	605,020	\$358,659 08	85,727	506	\$380,385 67	\$739,044 75

SAN MÁRCOS AND NAUTLA RAILWAY.

1891.....	4,582	\$ 3,181 70	5,307	750	\$ 5,968 12	\$ 9,149 82
1892.....	10,894	5,968 34	12,000	570	17,835 93	23,804 27
1893.....	14,136	7,339 14	19,576	000	27,008 47	34,347 61
1894.....	15,481	7,918 63	.....	.....	29,519 97	37,438 60
1895.....	17,309	8,195 77	24,452	440	27,603 55	35,799 32
Total...	62,402	\$32,603 58	61,336	760	\$107,936 04	\$140,539 62

MONTEREY AND GULF RAILWAY.

YEARS.	PASSEN- GERS.	PASSENGER RECEIPTS.	FREIGHT.		MISCELLA- NEOUS RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1889.....	16,714	\$ 17,144 65	4,197	432	\$ 13,440 52	\$ 30,585 17
1890.....	57,096	70,185 08	168,204	600	791,398 47	861,583 55
1891.....	94,052	112,910 64	174,829	706	876,563 75	989,474 39
1892.....	99,802	119,390 74	193,437	800	664,072 42	783,463 16
1893.....	107,378	141,093 86	238,442	000	820,433 06	961,526 92
1894.....	.....	.....	.....	.....	.....	.....
1895.....	127,900	150,005 75	329,059	008	1,162,009 39	1,312,015 14
Total..	502,942	\$610,730 72	1,108,170	546	\$4,327,917 61	\$4,938,648 33

CÓRDOVA AND TUXTEPEC RAILWAY.

1889.....	26,537	\$ 4,815 27	.....	.....	\$ 1,285 13	\$ 6,100 40
1890.....	49,142	8,917 06	.....	.....	2,379 97	11,297 03
1891.....	23,542	14,009 84	.....	.....	5,097 98	19,107 82
1892.....	39,885	12,767 51	2,235	571	5,111 19	17,878 70
1893.....	46,086	17,433 62	3,730	424	9,828 94	27,262 56
1894.....	.....	.....	.....	.....	.....	.....
1895.....	.....	.....	.....	.....	.....	.....
Total..	185,192	\$57,943 30	5,965	995	\$23,703 21	\$81,646 51

MARAVATÍO AND CUERNAVACA RAILWAY.

1890.....	3,466	\$ 3,389 66	.....	.....	\$ 3,372 10	\$ 6,761 76
1891.....	6,190	6,283 94	.....	.....	16,741 42	23,025 36
1892.....	9,081	8,047 76	.....	.....	30,160 42	38,208 18
1893.....	12,867	9,418 26	.....	.....	28,201 99	37,620 25
1894.....	15,138	11,235 58	.....	.....	32,238 33	43,473 91
1895.....	13,964	11,364 72	.....	.....	39,714 80	51,079 52
Total..	60,706	\$49,739 92	.....	.....	\$150,429 06	\$200,168 98

SALAMANCA AND SANTIAGO VALLEY RAILWAY.

1889.....	4,709	\$ 1,486 51	132	270	\$ 304 26	\$ 1,790 77
1890.....	18,836	5,946 04	529	080	1,217 04	7,163 08
1891.....	25,432	8,554 11	3,324	430	7,237 67	15,791 78
1892.....	21,923	8,020 59	2,815	940	5,325 03	13,345 62
1893.....	22,674	7,719 44	3,380	060	8,910 74	16,630 18
1894.....	27,496	8,740 90	4,142	690	9,584 17	18,325 07
1895.....	30,094	10,376 66	7,799	050	13,969 73	24,346 39
Total..	151,164	\$50,844 25	22,123	520	\$46,548 64	\$97,392 89

Railways.

209

MONTE ALTO RAILWAY.

YEARS.	PASSEN- GERS.	PASSENGER RECEIPTS.	FREIGHT		MISCELLA- NEOUS RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1892.....	31,080	\$ 2,652 89	4,006	000	\$1,330 13	\$ 3,983 02
1893.....	30,888	3,260 28	6,135	000	1,965 72	5,226 00
1894.....	31,913	3,318 14	6,221	000	2,002 79	5,320 93
1895.....	39,041	4,005 14	5,430	000	1,410 85	5,415 99
Total..	132,922	\$13,236 45	21,792	000	\$6,709 49	\$19,945 94

VALLEY OF MEXICO RAILWAY.

1891.....	1,423,652	\$ 99,615 09	9,108	000	\$ 5,912 38	\$105,527 41
1892.....	1,639,873	119,379 76	21,154	000	12,310 35	131,690 17
1893.....	1,637,135	110,160 60	24,361	000	21,497 48	131,658 08
1894.....	.....	.....	.....	.....	.....	.....
1895.....	.....	.....	.....	.....	.....	.....
Total..	4,700,660	\$329,155 45	54,623	000	\$39,720 21	\$368,875 66

PUEBLA INDUSTRIAL RAILWAY.

1891.....	151,380	\$ 23,234 66	.....	.....	\$ 1,398 00	\$ 24,632 66
1892.....	125,766	20,052 34	.....	.....	1,239 00	21,291 34
1893.....	155,112	24,082 55	.....	.....	1,380 00	25,462 55
1894.....	190,480	31,620 62	.....	.....	3,149 37	34,769 99
1895.....	226,275	36,264 00	14,250	000	11,122 35	47,386 35
Total..	849,013	\$135,254 17	14,250	000	\$18,288 72	\$153,542 89

MEXICAN NORTHERN RAILWAY.

1891.....	4,870	\$14,802 61	94,726	000	\$ 740,122 98	\$ 754,925 59
1892.....	4,369	14,802 61	177,781	825	1,337,853 47	1,352,656 08
1893.....	4,088	13,087 90	176,801	913	1,334,524 47	1,347,612 37
1894.....	.....	.....	.....	.....	.....	.....
1895.....	4,274	13,420 18	151,744	929	1,149,069 15	1,162,489 33
Total..	17,601	\$56,113 30	601,054	667	\$4,561,570 07	\$4,617,683 37

MEXICO CUERNAVACA AND PACÍFICO RAILWAY.

1895.....	17,209	\$19,214 84	84,434	000	\$130,662 86	\$149,877 70
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Statistical Notes on Mexico.

FEDERAL DISTRICT TRAMWAYS.

YEARS.	PASSENGERS.	PASSENGER RECEIPTS.	FREIGHT.		MISCELLANEOUS RECEIPTS.	TOTAL RECEIPTS.
			Tons.	Kilos.		
1873..	3,760,653	\$ 232,347 92	.....	.....	\$ 16,421 10	\$ 248,769 02
1874..	3,088,808	240,277 12	.....	.....	29,628 70	269,905 82
1875..	3,597,197	286,248 25	.....	.....	23,644 10	309,892 35
1876..	3,545,589	278,068 94	.....	.....	19,289 15	297,358 09
1877..	4,455,595	357,262 43	.....	.....	14,179 54	371,441 97
1878..	4,605,223	360,175 98	.....	.....	6,752 49	366,928 47
1879..	5,084,669	390,298 10	.....	.....	8,089 47	398,387 57
1880..	6,165,461	458,547 60	.....	.....	19,020 46	477,568 06
1881..	7,675,829	586,167 20	.....	.....	52,547 54	638,714 74
1882..	9,851,614	703,422 06	.....	.....	87,584 95	791,007 01
1883..	10,101,302	775,550 34	.....	.....	90,644 72	866,195 06
1884..	9,926,621	717,264 90	.....	.....	114,307 69	831,572 59
1885..	9,407,751	690,457 87	.....	.....	63,423 48	753,881 35
1886..	10,841,928	746,107 46	.....	.....	134,133 77	880,241 23
1887..	11,121,575	810,974 85	.....	.....	155,972 22	966,947 07
1888..	12,185,031	881,646 36	.....	.....	171,418 11	1,053,064 47
1889..	13,533,217	981,922 98	.....	.....	203,011 13	1,184,934 11
1890..	14,457,203	1,028,871 57	.....	.....	247,868 09	1,276,739 66
1891..	15,585,919	1,002,224 50	.....	.....	206,601 54	1,208,826 04
1892..	16,164,644	1,023,617 85	.....	.....	194,358 01	1,217,975 86
1893..	15,622,879	990,265 03	.....	.....	217,905 64	1,208,170 67
1894..	15,844,425	1,028,430 01	.....	.....	230,935 43	1,259,365 44
1895..	18,281,729	1,194,335 17	.....	.....	229,571 08	1,423,906 25
Total.	224,904,862	\$15,764,484 49	.....	.....	\$2,537,308 41	\$18,301,792 90

VERACRUZ AND ALVARADO RAILWAY.

1885.....	39,078	\$ 18,451 01	.....	...	\$ .....	\$ 18,451 01
1886.....	37,772	18,673 04	882	500	4,942 00	23,615 04
1887.....	29,971	16,677 46	.....	...	14,316 16	30,993 62
1888.....	58,127	33,174 25	.....	...	26,549 26	59,723 51
1889.....	63,328	36,779 93	8,500	412	31,779 57	68,559 50
1890.....	72,292	42,128 89	11,500	892	34,829 14	76,958 03
1891.....	74,317	39,304 87	16,845	178	44,831 36	84,136 23
1892.....	73,249	47,831 14	14,498	000	51,025 73	98,856 87
1893.....	73,705	47,298 50	22,976	000	49,955 98	97,254 48
1894.....	32,964	44,294 74	20,197	000	56,927 90	101,222 64
1895.....	87,291	53,050 84	22,764	103	69,450 61	122,501 45
Total..	642,094	\$397,664 67	118,164	085	\$384,607 71	\$782,272 38

Total Traffic and Receipts of Mexican Railways.—Before concluding this chapter, I append a statement of the total traffic and receipts of the Mexican Railways from 1873 to 1895, taken from the *Anuario Estadístico de la República Mexicana of 1895*, compiled in the Department of Communication of the Mexican Government from data furnished the same by the respective companies, in compliance with the provisions of their grants.

Railways.

211

RAILWAY SUBSIDIES PAID BY THE MEXICAN GOVERNMENT.

I append a statement of the railway subsidies paid by the Mexican Government from the beginning of railway construction to June 30, 1896, which is entirely correct, as it has been obtained from the accounts of the Federal Treasury of Mexico. I insert after that statement a detailed account of each of the railways to whom subsidies have

TRAFFIC AND RECEIPTS OF THE MEXICAN RAILWAYS.

RAILWAYS.	YEARS.	PASSEN- GERS.	PASSENGER RECEIPTS.	FREIGHT.		OTHER RECEIPTS.	TOTAL RECEIPTS.
				Tons.	Kilos.		
Mexican Railway.....	1873-1895	9,995,557	\$14,848,780 55	6,649,709	141	\$ 66,864,116 14	\$ 81,710,896 69
District National.....	1873-1895	225,104,865	15,764,484 40	4,783,356	....	2,537,368 41	18,301,798 41
Mexican National.....	1873-1895	17,467,445	10,457,511 15	4,783,356	914	28,154,266 11	38,609,777 26
Veracruz and Alvarado.....	1885-1895	6,494	397,664 67	118,164	085	384,607 71	782,272 38
Sonora Railway.....	1881-1895	568,451	1,341,876 18	577,117	252	3,244,522 20	4,586,400 38
Interoceanic Railway.....	1880-1895	10,033,381	4,759,173 00	3,422,455	782	13,174,436 70	17,931,609 70
Mexican Central and Branch from Tula to Pachuca.....	1881-1895	10,916,578	7,995,718 70	8,222,346	747	64,528,000 81	82,244,710 51
Hidalgo and Northeastern.....	1881-1895	1,218,413 72	1,441,834	1,441,834	727	3,207,970 64	4,666,384 36
Mérida and Progreso.....	1881-1895	1,377,131	561,468 15	647,313	545	1,201,977 63	1,853,148 78
Tehuacan and Esperanza (Tramway).....	1884-1895	186,674	135,438 20	285,709	660	512,355 10	647,793 30
Mérida and Peto.....	1884-1895	1,528,773	954,682 90	304,177	623	1,323,442 03	1,323,442 03
Sinaloa and Durango (Altata and Culiacan).....	1889-1895	480,722	164,095 18	98,366	694	331,755 74	495,660 92
Mérida and Campeche.....	1889-1895	1,000,010	311,094 63	138,575	716	368,618 40	619,713 12
Mérida and Valladolid.....	1883-1895	2,224,580	525,028 50	428,135	128	921,055 06	1,446,694 46
Tlamanalco.....	1883-1895	618,665	68,025 28	159,430	048	115,825 65	183,850 93
Mexican International.....	1893-1895	580,102	1,599,654 34	2,537,600	144	11,143,660 82	12,734,315 16
San Marcos and Nautla.....	1893-1895	62,302	32,623 58	61,356	765	107,936 04	140,559 62
San Juan Baptista and Paso del Carrizal.....	1889-1895	843,200	55,677 40	9,154	454	8,361 37	63,778 86
San Andrés and Chalchicomula.....	1889-1895	167,372	45,580 60	76,150	753	112,374 77	157,823 37
Orizaba and Ingeniero.....	1883-1895	1,124,861	128,767 86	5,268	417	4,759 22	123,526 08
Santa Ana and Tlaxcala.....	1883-1895	1,254,227	97,331 82	6,657	443	18,751 00	118,082 82
Cárdenas and Rio Grizal.....	1883-1894	4,440,038	4,390 23	.....	.....	4,638 77	6,609 00
Toluca and San Juan de las Huertas.....	1885-1895	141,353 45	124,515	124,515	640	94,217 40	235,732 85
Veracruz, Central, Natchuala, and Rio Verde.....	1889-1894	773,388	64,077 55	28,440	265	529,061 65	593,493 19
Mérida and Izamal.....	1887-1895	695,020	328,597 58	85,450	508	380,385 67	709,444 73
Mexican Southern.....	1880-1895	707,781	744,591 04	1,343,880	160	993,244 21	1,737,633 25
Monterrey and Gulf.....	1889-1895	524,152	610,730 72	1,084,170	546	4,357,917 61	4,968,648 33
Córdoba and Tuxtepec.....	1889-1894	165,129	57,943 30	5,995	995	3,793 21	81,168 51
Naravato and Cuernavaca.....	1889-1895	66,760	49,739 92	.....	.....	126,429 06	206,168 98
Salamanca and Valley of Santiago.....	1889-1895	151,164	94,644 25	121,253	530	46,548 40	97,392 69
Monte Alto.....	1889-1895	134,222	13,230 45	21,792	000	6,709 49	19,945 94
Valley of Mexico.....	1869-1893	4,600,660	394,155 45	54,663	000	29,720 21	368,675 66
Puebla Industrial.....	1869-1895	849,013	133,454 17	14,290	000	18,288 72	253,542 89
Mexican Northern.....	1869-1895	17,601	55,113 30	601,054	667	4,561,570 17	4,617,683 47
Mexican, Cuernavaca, and Pacific.....	1895.....	17,209	59,214 84	84,434	000	130,662 86	149,877 70
Total.....		\$66,570,955	\$73,586,396 84	31,238,024	640	\$ 209,603,000 29	\$ 283,194,417 13

Statistical Notes on Mexico.

SUBSIDIES PAID BY THE MEXICAN GOVERNMENT TO RAILWAY COMPANIES UP TO JUNE 30, 1896.

NAME OF RAILWAY.	DATE OF CONTRACT.	LENGTH OF LINE IN KILOMETRES.	AMOUNT OF SUBSIDY DUE.	PAYMENTS IN		
				Cash.	Certificates.	Bonds.
1 Mexican (Mexico City to Veracruz, via Orizaba and Cordova).....	1867, Nov. 27.	614.060	\$ 14,000,000 ..	\$13,085,104 59	.....	.....
2 Progreso & Mérida, Yucatan.....	1874, Jan. 17.	30.453	218,718 ..	218,718 ..	.....	.....
3 Hidalgo Ry (Mexico City to Pachuca).....	1874, Feb. 2.	154.011	1,232,088 ..	931,990 37	.....	.....
4 Veracruz Alvarado (coast line).....	1874, March 26.	55.000	440,000 ..	304,000 ..	.....	.....
5 Mérida & Peto, Yucatan.....	1874, March 27.	108.000	648,000 ..	577,445 85	.....	.....
6 Inter-oceanic (from Veracruz to Acapulco).....	1874, April 16.	743.267	5,570,511 12	2,566,938 ..	\$ 2,673,573 12	.....
7 Puebla and Matamoros Inter-car Railway.....	1874, May 6.	84.312	674,496 ..	674,496 ..	.....	.....
8 Tehuantepec Railway.....	1876, June 2.	300.617	19,181,172 72	5,081,172 72	.....	\$13,500,000 ..
9 Sinaloa & Durango R. R. (from Durango City to Mazatlan).....	1880, Aug. 16.	61.997	557,343 ..	557,343 ..	.....	.....
10 Mexican Central (Trunk line and branches, Mexico City to El Paso).....	1880, Sept. 8.	2,935.753	26,609,003 90	14,417,936 45	7,108,070 80	.....
11 Sonora Railway (from Nogales to Guaymas).....	1880, Sept. 13.	1,737.045	12,042,815 ..	.....	11,969,870 ..	.....
12 Mérida & Valladolid R. R. Yucatan.....	1880, Sept. 14.	422.312	2,956,184 ..	2,171,310 60	.....	.....
13 Mérida & Valladolid R. R. Yucatan.....	1880, Dec. 15.	108.668	642,008 ..	597,658 ..	.....	.....
14 Tlalmanalco (Local line in the State of Puebla).....	1881, Feb. 3.	26.650	159,000 ..	159,000 ..	.....	.....
15 Mérida & Campeche Railway (via Calcutin, Yucatan).....	1881, Feb. 23.	135.152	810,915 ..	70,500 ..	.....	340,000 ..
16 Nautla & San Marcos Railway (States of Puebla and Veracruz).....	1881, June 25.	75.000	450,000 ..	70,500 ..	.....	.....
17 San Juan Bautista & Tamulte-Pass. Railway (State Tabasco).....	1881, Sept. 17.	5.750	20,125 ..	20,125 ..	.....	.....
18 Chalchicomula Branch Railway (State of Puebla).....	1881, Sept. 20.	10.353	22,238 65	22,238 65	.....	.....
19 Tlaxcala & Santa Ana Railway (State Tlaxcala).....	1882, Dec. 11.	8.000	28,000 ..	28,000 ..	.....	.....
20 Cárdenas & Grijalva River Railway (State Tabasco).....	1883, May 12.	7.500	33,750 ..	33,750 ..	.....	.....
21 Toluca & Las Huertas Railway (State of Mexico).....	1883, May 25.	15.721	55,023 90	46,250 ..	.....	.....
22 Vauagas, Cedral, Matchuala & Rio-Verde (State S. Louis Potosi).....	1883, June 11.	65.000	357,500 ..	341,000 ..	.....	.....
23 Mérida & Soluta (State of Yucatan, via Izamal).....	1883, June 11.	65.848	395,088 ..	395,088 ..	.....	.....
24 Jiménez & Sierra Madre, via Hidalgo District (State Durango).....	1884, Nov. 13.	5.000	40,000 ..	.....	.....	.....
25 Mexican Southern (States of Puebla and Oaxaca).....	1884, Nov. 13.	367.000	11,248,805 10	880,805 10	.....	10,368,000 ..
26 Tonalá & Frontera (States of Chiapas and Tabasco).....	1886, April 21.	50.000	444,444 ..	.....	.....	444,000 ..
27 Monterey & Mexican Gulf (States of N. Leon and Tamaulipas).....	1886, Dec. 16.	624.640	5,534,572 24	.....	.....	5,534,572 24
28 Tecolutla (Gulf of Mexico) & Espinal (State of Veracruz).....	1887, Nov. 10.	10.000	100,500 ..	40,500 ..	.....	60,000 ..
29 Córdoba (State Veracruz) & Tuxtepec Railway.....	1887, Dec. 10.	19.000	408,000 ..	408,000 ..	.....	.....
30 Pachuca (State Hidalgo) & Tampico Railway.....	1888, June 5.	10.000	80,000 ..	.....	.....	80,000 ..
31 Maravatio & Iguala Railway (States Michoacan and Guerrero).....	1888, Aug. 16.	316.666 90	316,666 90	114,000 ..	.....	202,666 ..
32 Salamanca & Valley of Santiago Railway (State Guanajuato).....	1888, Aug. 28.	50.000	200,540 ..	114,000 ..	.....	86,540 ..
33 Veracruz & Boca del Rio Railway.....	1888, Aug. 30.	35.000	280,000 ..	280,000 ..	.....	.....
34 Veracruz & Boca del Rio Railway.....	1888, Aug. 31.	11.504	94,032 ..	83,000 ..	.....	.....
35 Tula, Zacualtipan (State of Hidalgo) & Tampico Railway.....	1889, Dec. 20.	70.000	560,000 ..	.....	.....	560,000 ..
36 Matamoros Inter-car (State of Puebla) & Acapulco (Pacific coast).....	1892, March 5.	40.000	688,776 40	111,370 62	.....	.....
37 Lower California Railway.....	1894, June 2.	80.000	177,777 77	.....	.....	.....
38 Monte-Alto branch Railway (State of Mexico).....	1894, Sept. 14.	10.000	66,666 66	.....	.....	66,000 ..
Total, 38 subsidized Railway Concessions.		9,106.533	\$107,743,660 25	\$4,640,601 95	\$21,711,513 92	\$31,197,572 24

been paid, stating the number of kilometres built, the amount of subsidy due for the same, and the manner in which the subsidy was paid, that statement being the most complete that has so far been published :

RÉSUMÉ.—Amount paid in Cash.....	\$ 46,896,901 95
“ “ Certificates of Construction (convertible in five per cent. bonds).....	21,711,513 92
“ “ Bonds.....	31,127,000 00
“ of Balance due (payable either in cash or Bonds),	8,008,244 38

Total amount of Subsidies, as per corresponding concessions, \$107,743,660 25

The Tehuantepec Railway cost of construction is herein included, in order to give a complete statement of the Government's pecuniary outlay for the construction of railways in the country. As the \$13,500,000 amount of the five per cent. Bonds paid on account of the construction of this line to the contractors, McMurdo & Co., represent a gold indebtedness, if reduced at the rate of 24 pence per dollar, the above total cost of railway construction should be increased by an equal amount, say \$13,500,000 Mexican currency—or a grand total of \$121,243,660.25.

DETAILED STATEMENT OF THE SUBSIDIES PAID BY THE MEXICAN
GOVERNMENT TO THE RAILWAY COMPANIES.

1. MEXICAN RAILWAY.—(From Mexico City to Veracruz.)

Subsidy as per original concession, \$560,000 per annum, during 25 years, equal to.....	\$14,000,000 00
Paid previous to October 21, 1890.....	10,187,315 79
Balance in favor of the company, on October 21, 1890, as per special agreement of the same date.....	\$3,497,878 80
9% deduction, for cash payment, according to the second clause of said agreement.....	314,805 41
Total payment.....	14,000,000 00

2. HIDALGO RAILWAY.—(From Mexico City to Pachuca, Hid.)

Subsidy, \$8000, per kilometre, as per concession	\$1,232,088 00
Paid on account thereof in cash.....	\$931,296 37
In 3% and 5% Bonds.....	300,791 63
Total payment.....	1,232,088 00

3. VERACRUZ & ALVARADO RAILWAY.—(Coast Line between
the said ports.)

Subsidy due the Company, \$6000 per kilometre, as per con- cession.....	\$440,000 00
Paid on account thereof, in cash	\$394,000 00
In 3% Bonds.....	46,000 00
	440,000 00

4. MERIDA & PETO RAILWAY.—(Between the two named towns,
State of Yucatan.)

Subsidy, due the Company, \$6000 per kilometre, as per con- cession.....	\$648,000 00
Paid in cash.....	\$577,445 85
In 3% Bonds.....	70,554 15
Total payment.....	648,000 00

5. INTEROCEANIC RAILWAY.—(Narrow gauge, from Veracruz to Acapulco, Pacific Coast.)

Subsidy due the Company.....		\$5,570,511 12
483. ⁸⁰ / ₁₀₀ Kilometres at \$8000.....	\$3,866,469 12	
81. ²²² / ₁₀₀ " " 6500.....	526,500 00	
140. ²²² / ₁₀₀ " " 6000.....	840,000 00	
38. ²⁵² / ₁₀₀ " unsubsidized.....		
Construction bounty earned, as per concession on the Mexico & Cuautla division.....	137,542 00	
Construction bounty earned, as per concession on the Jalapa & Veracruz division.....	200,000 00	5,570,511 12
Paid in cash.....	\$2,896,938 00	
In certificates already paid for, out of the 3% of the Customs Receipts... ..	2,673,573 12	
Total payment... ..		5,570,511 12

6. OCCIDENTAL RAILWAY.—(Between points in the States of Sinaloa and Durango.)

Length of the road, according to the concession 1373 kilometres, subsidy at the rate of \$8000, per kilometre, as follows :		
From Altata, (Port on the Pacific Coast, Gulf of California), to Culiacan, capital of the State of Sinaloa.....	61. ²²¹ / ₁₀₀ kilometres constructed	
From Culiacan to Durango and Fresnillo cities	600	
A Branch to Guaymas	536	
" " " Mazatlan	237	
	1,373	
Subsidy due for the first 61. ²²¹ / ₁₀₀ kilometres already built.....	\$495,416 00	
Construction bounty according to concession \$1000 per kilometre.....	61,927 00	
Total amount due and paid for to the Company.....		\$557,343 00

7. MEXICAN CENTRAL, and sundry branches.—(Trunk-line, from Mexico City to El Paso del Norte, on the Rio Grande River.)

Subsidy due in accordance with the corresponding charter was	\$26,609,003 50
As follows : for 1970. ²²² / ₁₀₀ kilometres of the trunk-line, of which 107 kilometres were subsidized at \$1500 per kilometre.....	\$ 160,500 00
And 1,863. ²²² / ₁₀₀ kilometres at \$9500 per kilometre.....	17,704,200 00 \$17,864,700 00
For 258. ²²² / ₁₀₀ kilometres of the	

Gaudalajara branch, which reduced as per special contract of Feb. 25, 1887, to 218. ⁵²⁰ kilometres at \$9500 per kilometre.....	\$2,076,510 00	
For 653. ⁵⁰⁰ kilometres of the Aguascalientes & Tampico Branch, at \$9500 per kilometre.....	6,208,250 00	
For 25 kilometres of the San Blas & Guaristamba at \$9500 per kilometre.....	237,500 00	8,522,260 00
For 23. ²⁷² kilometres of Silao & Guanajuato Branch at \$9500 per kilometre.....	222,043 50	
Total payment.....		\$26,609,003 50

This total amount, was settled and paid for in accordance with special agreement entered into by and between the Department of Public Works and the Company, on August 23, 1890, as follows :

Lands, art-works, drafts and plans, etc., due by the Company as per settlement effected December 22, 1881.....	\$ 34,204 39	
Rebate off the subsidy corresponding to 6600 kilometres of parallel lines, between Zacatecas & Guadalajara, as per agreement therefor	52,800 00	
Rebate off the subsidy on 50 kilometres of the line, between Tantoyuquita & Tampico, as per agreement.....	75,000 00	
Cash received by the Government of the State of San Luis Potosi, on account of the old branch line to Tampico.....	48,000 00	
Certificates of construction paid at various Custom Houses out of the 8% of the receipts of the same, during the fiscal years 1881-1890	7,108,070 80	
Paid with bills of exchange on London out of the proceeds of the loan negotiated in 1890.....	14,335,732 06	
25% discount on \$19,820,793 01, amount of the balance acknowledged in favor of the Company, according to the above mentioned agreement, (August 23, 1890).....	4,955,196 25	
Total payment.....		\$26,609,003 50

8. MEXICAN NATIONAL, and branches. — (Trunk-line from Mexico City to Laredo, Tamaulipas.)

The Company constructed 1737.⁰⁴⁵ kilometres for which the Government owed the following subsidies :—

On 1444. ⁰⁴⁸ kilometres of the trunk line, at the rate of \$7000 per kilometre.....	\$10,108,315 00
On 273. ²²² kilometres of the trunk line, at the rate of \$6500 per kilometre.....	1,774,500 00
On 20 kilometres of the Salto Branch at the rate of \$8000 per kilometre.....	160,000 00
Total amount of subsidy due.....	\$12,042,815 00

The above amount was paid in certificates of construction for..\$11,929,870 00 of which the sum of \$8,746,722 60 was paid at several Custom-Houses during the fiscal years 1882-1895, and the balance of \$3,183,147 40, was converted, by special agreement between the Treasury Department and Messrs. Lionel Carden and H. P. Webb, as representatives of the Company in 5% Bonds. The balance of \$112,945 which in the preceding statement, appears as pending of payment, was accepted by the Company, as the value of the Government's shares in the Salto Branch.

9. "SONORA RAILWAY."—(From Guaymas, on the Gulf of California, to Nogales, on the boundary line.)

Subsidy on 422 ²¹² kilometres at the rate of \$7000 per kilometre, \$	2,956,184 00
Paid to the Company, cash.....	\$ 2,071,310 60
Fine against the forfeiture of the concession...	100,000 00
3% Bonds in accordance with the provisions of the law of September 6th, 1894.....	784,873 40
Total payment.....	\$ 2,956,184 00

10. "MERIDA & VALLADOLID RAILWAY," with a branch.—(Between these two towns in the State of Yucatan.)

Subsidy due on 108. ²⁶⁸ kilometres at \$6000 per kilometre....	\$642,008 00
Paid for as follows, cash.....	\$ 597,608 00
In 3% Bonds (law of September 6th, 1894)....	44,400 00
Total payment.....	\$642,008 00

11. "MERIDA & CAMPECHE RAILWAY," *via*. Kalkini.—(Between the capitals of the States of Yucatan and Campeche.)

Subsidy due on 135. ¹⁵²⁵ kilometres at \$6000 per kilometre,	\$810,915 00
Paid to the Company in cash.....	\$766,915 00
In 3% Bonds.....	44,000 00
Total payment.....	\$810,915 00

12. "SAN MARCOS & NAUTLA RAILWAY."—Between San Marcos station on the Mexican Ry. and Nautla bar on the Gulf of Mexico.)

Subsidy due on 75 kilometres at \$6000 per kilometre.....	\$450,000 00
Paid to the Company as follows: Cash.....	\$ 70,500 00
In special 5% subsidy Bonds.....	349,000 00
In 3% Bonds according to the provisions of the law of September 6th, 1894.....	500 00
Rebatement of subsidy on 5 kilometres running parallel with the "Interoceanic Ry.....	30,000 00
Total payment.....	\$450,000 00

13. "TOLUCA & SAN JUAN de las HUERTAS RAILWAY."—(Between the capital of the State of Mexico and the San Juan estate.)

Subsidy due on 15. ¹²¹ kilometres at \$3500 per kilometre.....	\$55,023 50
Paid to the Company, cash.....	\$46,250 00
In 3% Bonds (law of September 6th, 1894).....	8,773 50
Total payment.....	\$55,023 50

14. "VANEGAS, CEDRAL, MATEHUALA & RIO VERDE RAILWAY."—(All townships within the State of San Luis Potosi.)

Subsidy due on 65. ⁰⁰⁰ kilometres at \$5500 per kilometre.....	\$357,500 00
Paid to the Company, cash.....	\$341,000 00
In 5% Bonds (September 6th, 1894).....	16,500 00
Total payment.....	\$357,500 00

15. "JIMENEZ and SIERRA MADRE RAILWAY."—(Through the Hidalgo District, State of Chihuahua.)

Subsidy due on 5. ⁰⁰⁰ kilometres at \$8000 per kilometre.....	\$40,000 00
The whole paid to the Company in 3% Bonds (Law of September 6th, 1894.	

16. "MEXICAN SOUTHERN RAILWAY."—(367 kilometres from the City of Puebla to Oaxaca.)

Subsidy due under agreement of May 4th, 1892.....	\$11,248,805 10
First annuity of interest paid to the Company in conformity with the original concession of April 21st, 1886.....	\$880,800 00
Conversion of the remaining 14 annuities, as per the above named agreement, in special Bonds denominated of the "Oaxaca Trunk Line".....	8,558,888 55
Bounty paid to the Company, as per original concession, in Bonds (special).....	1,809,116 55
Total payment.....	\$11,248,805 10
Of the total amount of special Bonds issued, \$10,368,000 00	
Cashed	1,108,000 00
Outstanding.....	9,260,000 00

17. "TONALA" (State of Chiapas, Pacific Coast) and "FRONTIERA RAILWAY."—(State of Tabasco, on the Gulf of Mexico.)

Subsidy on 50 kilometres at \$8000 per kilometre.....	\$400,000 00
Paid to the Company with 6% Bonds, valued at 90% of their nominal.....	\$444,444 00
The balance shown in the preceding statement in favor of the Company for \$44,444.00 proceeds from the want of a Bond of less value than \$1000 of the corresponding issue.	

18. "MONTEREY" (Capital of the State of Nuevo Leon) and
"MEXICAN GULF RAILWAY."—(Port of Tampico.)

Subsidy on 624.⁹⁴⁰ kilometres at \$8000 per kilometre..... \$5,534,572 24¹

Wholly paid for in 5% Bonds, issued under the law of September 6th, 1894, with the exception of a balance of \$572.24, which, on account of the want of bonds of less value than \$1000, is still pending of settlement. Of the original issue of special Bonds given to the Company in payment of the subsidy, \$235,000 is still pending of conversion.

19. "TECOLUTLA" (a bar on the Mexican Gulf) and "ESPINAL RAILWAY."—(Both in the State of Veracruz.)

According to the original concession, the subsidy granted to this Company was on 19 kilometres at the rate of \$4500 in cash per kilometre; but under a new agreement, dated January, 20th, 1892, it was settled as follows:

9 kilometres at the rate of \$4500 each in cash,	\$40,500 00
10 kilometres in Bonds at \$6000 each.....	60,000 00
Total payment.....	\$100,500 00

20. "PACHUCA" (Capital of the State of Hidalgo) and "TAMPICO RAILWAY."—(On the Mexican Gulf.)

Subsidy on 10.⁰⁰⁰ kilometres at \$8000..... \$80,000 00
Totally paid in Bonds, in accordance with the law of September 6th, 1894.

21. "MARAVATIO" & "IGUALA RAILWAY."—(Towns in the States of Michoacan and Guerrero, respectively.)

Subsidy on 50 kilometres at \$3000 in cash and	
\$3000 in special Bonds, under 10% discount	
off their nominal value, and paid for, cash,	\$112,000 00
Bonds.....	166,000 00
Total payment.....	\$316,666 50 ¹

22. "MEXICAN NORTHEASTERN RAILWAY."—(An extension of the
"Hidalgo" Ry. to Tizayuca, in the State of that name.)

Subsidy on 50. ⁹⁹⁰ kilometres at \$6000.....	\$300,540 00
Paid for, in cash.....	\$294,000 00
In 3% Bonds.....	6,540 00
Total payment.....	\$300,540 00

¹ Some of the total payments in this table do not correspond to the amount of subsidy due, because in some of those cases other payments have been made, like bounty, of which no account appears in the respective statement. In some cases a bounty was offered provided the road was finished before the time fixed in the respective grant.

23. "VERACRUZ & BOCA del RIO RAILWAY."

Subsidy acknowledged on 11. ²²⁴ kilometres at \$8000 per kilometre	\$92,032 00
Paid for, cash.....	\$83,000 00
In 3% Bonds.....	9,032 00
Total payment.....	\$92,032 00

24. "TULA, ZACUALTIPAN" (State of Hidalgo), and TAMPICO RAILWAY.

Subsidy on 70. ⁰⁰⁰ kilometres at \$8,000 per kilometre.....	\$560,000 00
The whole amount paid for in 5% Bonds, of which \$285,000 were outstanding on the 30th of June, 1896.	

25. "MATAMOROS IZUCAR" (State of Puebla) and "ACAPULCO RAILWAY."—(On the Pacific coast.)

Subsidy under contract of March 22d, 1895, on 40 kilometres..	\$988,776 49
Paid as follows: cash, for the amount of 2% interest annuities paid to the Company in conformity with the original concession...	\$111,370 62
In 5% Bonds, according to the above contract.....	877,405 87
Total payment.....	\$988,776 49

26. "LOWER CALIFORNIA RAILWAY."—(From the town of San Quintin to a point on the "Mexican Central," Chihuahua.)

Subsidy on 20 kilometres, payable in 6% Bonds at the rate of \$8000 per kilometre, the said Bonds, afterwards converted in conformity with the corresponding law of conversion, were taken by the Company under 10% discount off their nominal value.....	\$177,777 77
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27. "MONTE ALTO RAILWAY."—(Starts from the town of Tlalnepantla, on the Salto branch of the "Mexican National," towards Alizapan and Villa del Carbon.)

Subsidy on 10 kilometres at \$6000 per kilometre, payable in 6% Bonds taken by the Company at the rate of 90% of their face value.....	\$66,666 66
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28. TEHUANTEPEC R. R.—(Between Coatzacoalcos on the Gulf of Mexico, and Salina Cruz, on the Pacific coast.)

COSTS OF CONSTRUCTION TO THE MEXICAN GOVERNMENT.

I. CONTRACTORS, EDWARD LEARNED & Co.—(Contract of June 2d, 1879.)

35 kilometres, of which only 25 were paid for, at \$7500.....	\$187,500 00
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The Learned contract was rescinded by the Mexican Government on August 16th, 1882; but by agreement adjusted with J. Tyng, as representative of the contractors, who received the following payments:

Statistical Notes on Mexico.

December 21st, 1882,	\$125,000 00	
July 9th, 1883.....	403,618 44	
July 19th, 1883.....	101,068 48	
July 12th, 1888.....	1,075,726 90	1,705,413 82
Total amount paid to Learned & Co.....		\$1,892,913 82
Of which amount the sum of \$230,413.82 represents interest accrued at the rate of 6% per annum ; so that the 35 kilometers built by these contractors actually cost \$14,083.25 per kilometre.		

2. CONTRACTOR, MR. DELFIN SANCHEZ.—(Agreement of October 5th, 1882.)

This contractor received from the Government the sum of.....	\$1,079,135 40	
For the purchase of material, which he only accounted for the amount of \$908,-910.50 the balance of		\$170,224 90
Having been donated to the contractor according to special agreement of April 25th, 1888.		
The same contractor received in 150 weekly installments of \$1900 each during the fiscal years 1885, 1888	\$285,000 00	
Mr. Sanchez delivered as constructed 74 kilometers which were paid to him at the rate of \$25,000 each.....	\$1,850,000 00	\$2,305,224 90

3. MAC-MURDO CONTRACT.—(Agreement approved by Decree of October 15th, 1888.)

For the completion of the construction and the furnishing of all the rolling material, etc., and for which the Contractors received in payment in 5% Bonds, special issue, principal and interests payable in sterling currency, £2,700,000.....		\$13,500,000 00
This contract was rescinded on the 13th of January, 1892, when the contractors, in settlement of accounts, surrendered to the Government the sum of about \$2,000,-000 as surplus proceeding from the sale of the said bonds, and delivered, more or less, 250 kilometres of the lines as built or repaired within the stipulations of the said contract.		

4. STANHOPE, HAMPSON & CORTHEL CONTRACT.—(Made under Decree of December 6th, 1893.)

For the construction of 59 kilometres and the completion of all the necessary works for the preservation and working of the whole line, for the fixed sum of,.....	\$1,483,035 00	
Total cost of the line.....	\$19,181,173 72	

PUBLIC DEBT.

In the first part of this paper I gave a brief statement of the different loans and liabilities which constitute the Mexican debt, and that statement will make it easy to understand the different issues and denominations of our bonds. Here I append a detailed statement of the National Debt of Mexico, up to June 30, 1896, submitted to Congress by the Secretary of the Treasury on the 14th of December, 1896, and a further statement containing the same data in a more concise form.

STATEMENT OF THE NATIONAL DEBT OF MEXICO TO JUNE 30, 1896.

Bonded Debt, Principal and Interest payable in Sterling currency.

Six per cent. interest bearing Bonds for the Loan of 1888, with .. % sinking fund, Capital and Interest.....	\$51,908,786 50
Six per cent. interest bearing Bonds for the Loan of 1890, with .. % sinking fund, Capital and Interest.....	30,068,710 25
Six per cent. interest bearing Bonds for the Loan of 1893, with .. % sinking fund, Capital and Interest.....	15,325,561 50
Five per cent. interest bearing Bonds for the Construction of the Tehuantepec Railway, 1889, Capital....	13,500,000 00
Six per cent. (non converted balance) Bonds of the Loan, contracted in London, 1851, Capital.....	134,153 12
Total amount of outstanding Bonds, payable in Sterling currency.....	\$110,937,211 37

Bonded Debt, Principal and Interest payable in Mexican Silver currency.

Three per cent. interest bearing Bonds of the Interior Consolidated Debt, Capital and Interest.....	\$52,464,927 60
Five per cent. interest bearing Bonds of the Interior Redeemable Debt, first series, Capital and Interest....	19,995,689 48
Five per cent. interest bearing Bonds of the Interior Redeemable Debt, second series, Capital and Interest.....	987,127 15
Subsidy Bonds, non converted balances, for sundry works and railways, Capital.....	9,792,865 75
Total	83,240,609 98
Railway Construction Certificates, pending of conversion, Capital.....	219 17
Balance-certificates corresponding to the fiscal years comprehended between 1882 and 1894, Capital pending of conversion.....	329,221 91
Total amount of bonded debt, payable in Mexican Silver currency.....	83,570,051 06

Grand Total of Bonded Liabilities.....

\$194,507,262 43

Liabilities from various sources, and in forms, other than Bonds, payable in Mexican Silver currency.

To Railway, Harbor Works and Drainage of the Valley of Mexico, Contractors.....	\$ 501,741 02
To Unpaid for Appropriations in the Budgets for the fiscal years between 1891 and 1896....	612,337 82
To other credits pending of settlement: on account of the same Budgets.....	600,894 63
To Balances in Account-current due various Contractors with some of the Executive Departments.....	315,818 95
To sundry, cash or otherwise executed, Deposits, as guarantee for pending contracts.....	2,681,662 95
To provisional certificates issued on account of the 1888, 1890 and 1893, Sterling Loans.....	3,738,684 12
To cash or other values pending of classification in the corresponding accounts.....	74,434 57
To cash Receipts on account of credits, other than fiscal and pending of payment to the corresponding offices.....	32,829 68
To Balance due to Mint-Lessee.....	48,214 89
To outstanding Bills Payable.....	111,186 28

Total Amount of Liabilities from various sources and in forms other than Bonds....

8,717,804 92

Grand Total of the Mexican National Debt.....

\$203,225,067 34

Statistical Notes on Mexico.

STATEMENT OF THE FEDERAL PUBLIC DEBT ON JUNE 30, 1896.

	BONDED DEBT.				INDEBTEDNESS SETTLED IN SUNDRY FORMS OTHER THAN BONDS.	
	Interest bearing annual.	Sinking fund.	Principal and interest payable in sterling money.	Payable in Mexican silver currency.	Payable in sterling money.	Payable in Mexican silver currency.
Balance of the loan contracted in London in 1851, not presented to conversion.....	6 1/2	1/2	\$ 134,153 12	.....	.....	.....
Loan of 1888 in Berlin and London to refund the loan of 1825.....	5 1/2	1/2	51,008,786 90	.....	.....	.....
Loan of 1889 for the Tehuantepec Railway.....	5 1/2	1/2	13,500,000 00	.....	.....	.....
Loan of 1890 for the payment of railway subsidies.....	6 1/2	1/2	30,008,710 85	.....	.....	.....
Loan of 1893 to pay public indebtedness.....	6 1/2	1/2	15,385,561 50	.....	.....	.....
Conversion of 1886 to 1896 of the interior debt.....	3	.....	.....	\$52,464,927 60	.....	.....
Conversion of 1894 in settlement of railway and public works, claims, first series.....	5 1/2	1/2	.....	19,995,689 48	.....	.....
Conversion of 1895 in settlement of railway and public works, claims, second series.....	5 1/2	1/2	.....	987,127 15	.....	.....
Special subsidy bonds pending conversion under the law of September 6, 1894.....	.....	.....	9,792,865 73	.....	.....	219 27
Balances of certificates of railway construction.....	.....	.....	.....	.....	.....	329,221 91
Certificates of balances due for public services, pending of conversion.....	.....	.....	.....	.....	.....	.....
Balances due to several railways, public works, and drainage of the Valley of Mexico contractors.....	.....	.....	.....	.....	.....	801,741 02
Unpaid appropriations of 1891 to 1896.....	.....	.....	.....	.....	.....	612,337 82
Sundry claims on said appropriations pending liquidation.....	.....	.....	.....	.....	.....	600,864 63
Balance, favor of sundry contracts with the various departments.....	.....	.....	.....	.....	.....	315,218 95
Sundry deposits to guarantee pending contracts.....	.....	.....	.....	.....	.....	2,081,662 95
Provisional certificates—not submitted to conversion—issued on the sterling loans of 1888, 1890, and 1893.....	.....	.....	.....	.....	\$3,738,684 12	.....
Cash receipts on account of municipal dues—pending of payment.....	.....	.....	.....	.....	.....	32,820 08
Cash receipts pending of classification for the corresponding accounts.....	.....	.....	.....	.....	.....	74,434 57
Balances due to mint lessees.....	.....	.....	.....	.....	.....	48,214 69
Outstanding treasury bills.....	.....	.....	.....	.....	.....	111,186 26
Total.....	.....	.....	\$10,937,211 37	\$83,240,609 98	\$3,738,684 12	\$5,308,961 87
Grand total.....	.....	.....	.....	.....	.....	\$203,225,067 34

POST-OFFICE AND TELEGRAPH SERVICE.

I append a statement containing the number of post-offices, and postal agencies in each of the Mexican states in 1895, and the number of postal pieces transported by Mexican mails from the years 1878-1879 to 1894-1895. (See page 225.)

I have prepared a statement of the earnings and expenditures of the post-office and telegraph services in Mexico during the twenty-seven fiscal years elapsed from July 1, 1869, to June 30, 1896. It was not possible to obtain full data of the earnings of the telegraph lines during the first ten years of that period, on account of the defective way in which the books were kept by the Federal Treasury of Mexico. With that exception the data embraced in the following statement is correct, as it has been taken from the official accounts. (See p. 224.)

POST-OFFICES IN MEXICO IN 1895 BY STATES.

STATES.	POST-OFFICE.	POSTAL AGENCIES.	TOTAL.
Aguascalientes.....	5	5 ..	10
Campeche.....	8	3 ..	11
Chiapas.....	7	24 ..	31
Chihuahua.....	24	58 ..	82
Coahuila.....	25	26 I	52
Colima.....	2	9 ..	11
Durango.....	19	42 ..	61
Federal District.....	1	8 10	19
Guanajuato.....	27	38 ..	65
Guerrero.....	13	31 ..	44
Hidalgo.....	19	43 ..	62
Jalisco.....	35	83 ..	118
Lower California.....	7	17 ..	24
Mexico.....	14	21 ..	35
Michoacan.....	22	59 ..	81
Morelos.....	9	9 ..	18
New Leon.....	18	33 ..	51
Oaxaca.....	22	39 ..	61
Puebla.....	27	77 I	105
Querétaro.....	7	10 ..	17
San Luis Potosí.....	18	34 ..	52
Sinaloa.....	16	28 ..	44
Sonora.....	14	75 ..	89
Tabasco.....	5	16 ..	21
Tamaulipas.....	17	36 ..	53
Tepic.....	7	13 ..	20
Tlaxcala.....	9	7 ..	16
Veracruz.....	36	82 ..	118
Yucatan.....	16	40 ..	56
Zacatecas.....	20	23 I	44
Total.....	469	989 13	1471

EARNINGS AND EXPENDITURES OF THE POST-OFFICE AND TELEGRAPH SERVICES DURING THE LAST TWENTY-SEVEN FISCAL YEARS, FROM JULY 1, 1869, TO JUNE 30, 1896.

FISCAL YEARS.	POST-OFFICE.		TELEGRAPH.		BOTH SERVICES.—TOTAL.	
	Dr. Expenditure.	Cr. Earnings.	Dr. Expenditure.	Cr. Earnings. ¹	Dr. Expenditure.	Cr. Earnings. ¹
1869-1870...	\$ 134,399 06	\$ 120,120 24	\$ 29,212 73	\$ 1,809 53	\$ 163,611 79	.....
1870-1871...	154,574 90	167,348 85	84,150 00	.....	238,724 90	.....
1871-1872...	349,324 63	265,440 22	48,379 77	.....	398,704 40	.....
1872-1873...	457,153 19	474,819 11	74,418 96	.....	529,572 15	.....
1873-1874...	491,199 48	523,583 09	174,504 32	.....	665,703 80	.....
Total in five years..	\$ 1,575,651 26	\$ 1,551,311 51	\$ 408,665 78	.....	\$ 1,984,317 04	.....
Average per annum.	\$ 315,130 25	\$ 310,262 30	\$ 81,733 16	.....	\$ 396,863 41	.....
1874-1875...	641,836 35	549,820 14	190,366 06	.....	\$ 832,202 41	.....
1875-1876...	480,299 37	455,473 12	161,795 66	.....	642,095 03	.....
1876-1877...	530,032 95	441,329 10	134,830 00	.....	664,862 97	.....
1877-1878...	684,076 21	590,384 36	241,200 00	.....	925,276 21	.....
1878-1879...	867,189 75	679,392 06	259,095 86	\$ 1,789 15	1,126,885 61	.....
Total in five years..	\$ 3,202,034 63	\$ 2,716,398 78	\$ 987,287 60	.....	\$ 4,189,322 23	.....
Average per annum.	\$ 640,406 93	\$ 543,279 76	\$ 197,457 52	.....	\$ 837,864 45	.....
1879-1880...	\$ 892,856 73	\$ 708,080 39	\$ 348,290 24	\$ 101,064 60	\$ 1,241,146 97	\$ 807,145 08
1880-1881...	983,606 17	833,830 87	196,542 94	135,144 02	1,180,140 11	968,974 89
1881-1882...	873,201 78	704,766 47	570,155 25	174,301 24	1,443,357 03	879,067 71
1882-1883...	840,354 70	795,122 86	916,657 53	219,384 91	1,757,012 23	1,014,507 77
1883-1884...	878,519 75	698,019 36	677,729 50	239,051 45	1,556,249 25	937,070 81
Total in five years..	\$ 4,468,539 13	\$ 3,733,819 95	\$ 2,709,375 46	\$ 868,946 31	\$ 7,177,914 59	\$ 4,602,766 26
Average per annum.	\$ 893,707 83	\$ 746,763 99	\$ 541,875 09	\$ 173,789 26	\$ 1,435,582 92	\$ 920,553 25
1884-1885...	\$ 1,411,183 03	\$ 642,660 19	\$ 618,829 54	\$ 180,820 77	\$ 2,030,012 57	\$ 823,480 96
1885-1886...	751,227 37	672,329 80	622,858 67	155,442 82	1,374,086 24	827,772 62
1886-1887...	943,334 74	739,732 65	718,821 70	197,478 87	1,662,154 04	937,211 52
1887-1888...	956,701 47	793,873 74	799,074 24	275,856 95	1,755,775 71	1,069,730 69
1888-1889...	1,049,880 10	880,530 93	820,072 05	329,493 13	1,869,952 15	1,210,024 06
Total in five years..	\$ 5,112,324 71	\$ 3,729,127 31	\$ 3,579,656 20	\$ 1,139,092 54	\$ 6,691,980 91	\$ 4,868,219 85
Average per annum.	\$ 1,022,464 94	\$ 745,825 46	\$ 715,931 24	\$ 227,818 51	\$ 1,738,396 18	\$ 973,643 97
1889-1890...	\$ 1,126,436 69	\$ 994,112 87	\$ 872,316 89	\$ 388,926 07	\$ 1,998,753 58	\$ 1,383,038 94
1890-1891...	1,196,329 61	1,064,153 40	972,164 06	462,076 59	2,168,493 60	1,546,229 99
1891-1892...	1,342,437 11	1,127,563 18	1,045,726 44	501,802 33	2,388,163 55	1,649,365 51
1892-1893...	1,278,587 20	1,153,401 20	1,073,105 81	528,881 96	2,351,693 01	1,682,283 16
1893-1894...	1,250,855 82	1,213,309 46	954,864 48	524,634 33	2,205,790 30	1,737,043 79
Total in five years..	\$ 6,194,646 45	\$ 5,572,540 11	\$ 4,918,177 68	\$ 2,406,321 28	\$ 8,112,824 13	\$ 7,978,861 39
Average per annum.	\$ 1,238,929 29	\$ 1,114,508 02	\$ 983,635 54	\$ 481,264 26	\$ 2,222,564 83	\$ 1,595,772 28
1894-1895...	\$ 633,201 36	\$ 1,337,691 40	\$ 531,049 48	\$ 547,308 67	\$ 1,164,550 03	\$ 1,885,000 07
1895-1896...	1,228,784 30	1,062,415 99	1,025,347 29	622,340 60	2,254,131 59	1,684,756 68
Total in two years..	\$ 1,861,985 66	\$ 2,400,107 39	\$ 1,557,296 77	\$ 1,169,649 36	\$ 3,410,282 43	\$ 3,569,756 75
Average per annum.	\$ 930,992 83	\$ 1,200,053 70	\$ 778,648 38	\$ 584,824 68	\$ 1,705,141 21	\$ 1,784,878 38
Total in the 27 years...	\$22,415,181 84	\$19,703,305 05	\$14,160,459 49	\$ 5,584,009 49	\$36,575,641 33	\$21,019,604 25
Average per annum.	\$ 830,191 92	\$ 729,752 04	\$ 524,461 46	\$ 328,471 14	\$ 1,354,653 38	\$ 1,236,447 30

¹ The totals and averages per annum in the columns marked "Earnings" and "Total Earnings" only embrace seventeen years, as the returns for the first ten years being very incomplete are not computed.

**NUMBER OF PIECES TRANSPORTED BY MEXICAN MAILS FROM 1878-1879
TO 1894-1895.**

FISCAL YEARS.	NUMBER OF PIECES.
1878-1879	5,992,611
1879-1880	5,786,790
1880-1881	6,141,790
1881-1882	6,732,504
1882-1883	10,640,516
1883-1884	10,488,518
1884-1885	11,905,209
1885-1886	13,289,591
1886-1887	16,504,034
1887-1888	27,429,018
1888-1889	43,052,800
1889-1890	95,852,939
1890-1891	111,406,893
1891-1892	116,778,853
1892-1893	122,821,359
1893-1894	35,818,148
1894-1895	24,773,636

Total..... 665,415,209

Printed matter, samples, and parcel post articles in the year 1894-1895, weighed in grammes, 1,107,755,679.

The notable reduction which appears in the last two years is due to the fact that in the preceding years all correspondence was counted, namely : such pieces as were received and sent, and such as came in transit, while in the last two years only are accounted such as were sent.

BANKS.

The following statement contains a list of all the banks existing in Mexico up to December 31, 1895, and their respective condition :

LIST OF MEXICAN BANKS.

STATE.	LOCATION.	NAME OF BANK.	DATE OF CHARTER.
Federal District.	Mexico City....	National Bank of Mexico.....	February, 1882.
" "	" "....	International and Hypothecary Bank of Mexico.....	May, 1883.
" "	" "....	Bank of London and Mexico..	October, 1886.
Chihuahua..	Chihuahua City..	Mexican Chihuahua Bank....	September, 1888.
"	" "....	Chihuahua Mining Bank.....	September, 1888.
"	" "....	Chihuahua Bank.....	December, 1889.
"	" "....	Chihuahua Commercial Bank..	December, 1890.
Yucatan.....	Merida.....	Yucateco Bank.....	February, 1890.
"	"	Yucatan Mercantile Bank....	March, 1890.
Durango.....	Durango City..	Durango Bank.....	June 1, 1891.
Zacatecas.....	Zacatecas City..	Zacatecas Bank.....	December, 1891.
New Leon.....	Monterey	New Leon Bank.....	February 18, 1892.

SITUATION OF THE MEXICAN BANKS ON DECEMBER 31, 1894.

	NATIONAL BANK OF MEXICO.	BANK OF LONDON AND MEXICO.	INTERNA- TIONAL AND HYPOTHECARY BANK OF MEXICO.	CHIHUAHUA MINING BANK.	MEXICAN CHIHUAHUA BANK.	CHIHUAHUA COM- MERCIAL BANK, ON FEBRUARY 15, 1895.
Social capital....	\$20,000,000 00	\$3,000,000 00	\$5,000,000 00	\$ 600,000 00	\$610,000 00	\$600,000 00
Unpaid capital.	12,000,000 00	.....	1,500,000 00	.....	.....	300,000 00
Accumulated capital.....	.....	.....	.....	.....	50,342 62	.....
Reserve funds..	1,796,100 51	1,100,000 00	34,500 00	105,000 00	108,600 00	5,000 00
Emergency funds.....	2,500,000 00	.....	.....	22,729 55	6,028 00	.....
Real estate.....	190,000 00	111,266 94	242,662 76	.....	100,855 86	.....
Cash.....	20,630,086 89	7,783,647 78	656,496 33	292,555 01	265,630 62	52,026 61
Cash in hand...	11,962,994 35	8,892,749 25	1,581,974 19	1,167,942 29	281,713 84	229,199 13
Guarantee ad- vances.....	3,093,555 21	.....	.....	.....	.....	.....
Advances on mortgages.....	.....	.....	2,788,527 85	.....	94,124 01	.....
Debtors' cur- rent accounts...	12,605,302 02	5,318,895 69	1,854,417 78	264,538 80	786,198 62	222,115 52
Bills in circula- tion.....	16,417,061 00	9,195,535 00	.....	538,429 25	287,133 28	122,782 00
Mortgage bonds in circulation.....	.....	.....	1,947,200 00	.....	.....	.....
Deposits and creditors' cur- rent accounts.	21,768,776 96	8,811,024 66	1,642,378 91	458,877 30	465,519 05	75,559 32

	CHIHUAHUA BANK, ON JANUARY 15, 1895.	YUCATECO BANK.	YUCATAN MERCANTILE BANK.	DURANGO BANK.	ZACATECAS BANK.	NEW LEON BANK.
Social capital....	\$500,000 00	\$1,000,000 00	\$ 750,000 00	\$500,000 00	\$600,000 00	\$600,000 00
Unpaid capital.	200,000 00	.....	.....	.....	.....	.....
Reserve funds..	5,666 25	22,654 71	17,716 89	3,396 88	6,500 00	8,278 22
Real estate, fur- niture, etc.....	.....	.....	.....	.....	.....	175,619 62
Cash.....	40,174 41	475,519 43	508,805 68	178,222 55	250,376 35	240,066 38
Cash in hand...	109,113 11	1,346,715 63	1,001,457 81	603,039 00	565,032 52	600,323 71
Guarantee ad- vances.....	.....	.....	.....	71,894 13	98,196 13	231,094 10
Debtor's current accounts.....	285,441 59	172,391 75	426,601 32	322,927 09	339,306 74	118,521 26
Bills in circula- tion.....	98,885 00	658,726 00	658,312 00	227,079 00	185,346 00	565,412 00
Deposits and creditors' cur- rent accounts.	30,277 86	313,246 10	510,835 92	445,667 79	701,065 74	191,928 26

PUBLIC LANDS.

I append four statements of the titles of public lands issued by the Mexican Government. The first one embraces a résumé of the titles issued without cost, and under the act of December 14, 1874, of the Indian town lands held in common, called in Spanish "Ejidos" to the respective inhabitants of the said towns, from 1877 to 1895: the second embraces a résumé of the titles issued in 1894 and 1895 for public lands held by private parties as portions of public land bought from the government but which were in excess of the respective titles, which we call in Spanish "Demacias": the third one embraces a résumé of the titles of public lands issued to private parties in the years 1894

and 1895 : and the fourth contains a résumé of the titles issued by the Mexican Government to surveying companies for one-third of the land respectively surveyed by them in 1894 and 1895, according to law and the respective contracts.

**FREE TITLES ISSUED UNDER THE ACT OF DECEMBER 14, 1874, OF
THE INDIAN TOWN LANDS TO THE RESPECTIVE
INHABITANTS FROM 1877 TO 1895.**

YEARS.	TITLES.	AREA.		
		Hectares.	Ares.	Cts.
1877.....	1	85	06	00
1878.....	195	3,572	71	41
1879.....	72	128,144	94	56
1880.....	2	5,000	00	00
1882.....	195	5,629	29	69
1883.....	259	14,616	14	13
1884.....	1,932	61,497	56	94
1885.....	383	13,068	18	08
1886.....	774	20,662	93	12
1887.....	254	2,999	85	98
1888.....	1,524	20,547	73	16
1889.....	2,237	100,627	65	32
1890.....	1,130	68,086	31	86
1891.....	499	6,516	74	22
1892.....	1,449	15,807	30	95
1893.....	452	17,709	59	08
1894.....	791	6,262	71	49
1895.....	273	6,160	03	65
Total.....	12,422	496,994	79	64

**TITLES ISSUED FOR UNWARRANTED POSSESSION BY PRIVATE PARTIES
OF PUBLIC LANDS IN 1894 AND 1895.**

YEARS.	Number of Titles.	AREA.			VALUE.
		Hectares.	Ares.	Cts.	
1894.....	17	34,781	98	04	\$21,554 91
1895.....	10	69,557	33	21	20,254 12
	27	104,339	31	25	\$41,809 03

**TITLES OF PUBLIC LANDS ISSUED TO PRIVATE PARTIES IN
1894 AND 1895.**

YEARS.	Number of Titles.	AREA.			VALUE.
		Hectares.	Ares.	Cts.	
1894.....	21	86,385	63	26	\$140,067 72
1895.....	19	59,265	24	84	81,883 95
	40	145,650	88	10	\$221,951 67

**TITLES ISSUED IN 1894 AND 1895 TO SURVEYING COMPANIES FOR
ONE-THIRD OF THE LAND SURVEYED BY THEM.**

YEARS.	Number of Titles.	AREA.		
		Hectares.	Ares.	Cts.
1894.....	32	484,257	30	70
1895.....	29	243,576	11	81
	61	727,833	42	51

EDUCATION.

The following official data received by the Census Bureau of the Mexican Government contains the number of schools in the different States of Mexico, supported by the Federal, State, and municipal administrations, and the number of students attending the same. That statement does not include the States of Mexico and Veracruz, which are among those having the largest number of schools and attendance.

I also append a statement of the number of schools supported by private parties, with the number of pupils attending the same and their cost; and finally a detailed statement of the public libraries existing in Mexico, and newspapers published in the country, taken from the publication of the Census Bureau in 1895.

NEWSPAPERS PUBLISHED IN MEXICO IN 1895.

Aguascalientes	10	New Leon.....	8
Campeche	4	Oaxaca	5
Chiapas	4	Puebla	17
Chihuahua	19	Queretaro.....	1
Coahuila.....	6	San Luis Potosí.....	6
Colima	13	Sinaloa.....	14
Durango.....	7	Sonora	12
Federal District, City of Mexico....	115	Tabasco.....	14
Guanajuato	14	Tamaulipas	20
Guerrero	6	Territory of Tepic.....	6
Hidalgo	3	TLaxcala	2
Jalisco	43	Veracruz	24
Lower California (Territory).....	5	Yucatan.....	18
Mexico.....	11	Zacatecas.....	12
Michoacan	30		
Morelos	5	Total.....	454

These are published in several languages, namely :

English.....	12	German	1
French	2	Spanish.....	439
		Total.....	454
Dailies.....	44	Bi-monthly	3
Semi-weekly	33	Quarterly.....	5
Tri-weekly.....	5	Yearly	3
Weekly.....	185	Unknown.....	10
Semi-monthly	79		
Monthly	87	Total.....	454

EDUCATION.

PUBLIC SCHOOLS SUPPORTED BY THE FEDERAL, STATE, AND MUNICIPAL ADMINISTRATIONS OF MEXICO IN 1895.

STATES.	SCHOOLS SUPPORTED BY THE GOVERNMENT.				SCHOOLS SUPPORTED BY THE MUNICIPALITY.				GRADES.			
	Males.	Females.	Both sexes.	Total.	Males.	Females.	Both sexes.	Total.	Primary.	Secondary.	Professional.	Total.
Aguascalientes.....	1	1	.....	2	20	14	.....	43	43	2	.....	45
Amplante.....	30	18	.....	48	10	.....	3	27	72	1	.....	75
Camahuila.....	21	.....	.....	21	69	55	5	129	131	2	.....	133
Colima.....	31	21	.....	52	1	.....	.....	1	43	.....	.....	43
Chapas.....	71	31	120	176	.....	.....	.....	.....	177	.....	.....	178
Chihuahua.....	70	36	106	176	.....	.....	.....	.....	110	1	.....	111
Durango.....	96	77	.....	173	.....	.....	.....	.....	112	2	.....	114
Guerrero.....	122	57	.....	179	.....	.....	.....	.....	310	2	.....	312
Guajuato.....	104	57	.....	161	55	47	.....	102	293	2	.....	295
Hidalgo.....	104	104	208	412	6	.....	.....	10	515	1	.....	516
Jalisco.....	104	94	198	398	.....	.....	.....	.....	479	2	.....	481
Michoacan.....	53	54	107	208	.....	.....	.....	.....	221	1	.....	222
Morelos.....	512	101	.....	613	210	90	11	311	311	1	.....	312
Nuevo Leon.....	11	3	4	18	18	8	.....	26	638	1	.....	640
Oaxaca.....	89	30	.....	119	717	286	167	1,170	1,182	3	.....	1,185
Puebla.....	86	81	167	313	.....	.....	.....	.....	117	.....	.....	117
Querétaro.....	1	.....	.....	1	.....	.....	.....	.....	340	1	.....	341
San Luis Potosi.....	.....	.....	.....	.....	.....	.....	.....	.....	252	.....	.....	252
Sinaloa.....	.....	.....	.....	.....	.....	.....	.....	.....	156	.....	.....	156
Sonora.....	.....	.....	.....	.....	.....	.....	.....	.....	162	.....	.....	162
Tabasco.....	25	22	47	72	107	40	6	.....	77	1	.....	78
Tamaulipas.....	4	2	6	12	74	41	4	119	110	6	.....	116
Tlaxcala.....	122	66	34	222	.....	.....	.....	.....	231	.....	.....	231
Yucatan.....	168	92	1	261	40	22	.....	71	328	1	.....	329
Zacatecas.....	.....	.....	.....	.....	174	110	132	425	425	1	.....	426
Federal District.....	9	6	8	23	128	116	26	270	292	.....	.....	292
Territory of Tepic.....	.....	.....	.....	.....	58	20	4	91	91	.....	.....	91
Lower California Territory, Southern District.....	.....	.....	.....	.....	7	8	.....	28	28	.....	.....	28
Lower California Territory, Northern District.....	2	2	6	10	.....	.....	.....	.....	11	.....	.....	11
Totals.....	2,189	1,110	748	4,046	1,754	932	708	3,394	7,380	34	36	7,450

EDUCATION.

PUBLIC SCHOOLS SUPPORTED BY THE FEDERAL, STATE, AND MUNICIPAL ADMINISTRATIONS OF MEXICO IN 1895—Continued.

STATES.	ALUMNI INSCRIBED IN THE YEAR.			MEDIUM ATTENDANCE DURING THE YEAR.			AGES.				ADVANCEMENT.		
	Males.	Females.	Total.	Males.	Females.	Total.	Over 5 years.	From 5 to 10 years.	From 10 to 15 years.	Over 15 years.	Alumni examined.	Alumni passing examination.	Graduated.
Aguascalientes.....	2,574	1,715	4,289	1,700	1,218	2,918	190	2,470	1,375	304	2,054	2,735	41
Campeche.....	2,320	1,662	3,982	1,725	1,181	2,906	375	2,540	1,611	511	2,076	2,601	22
Coahuila.....	6,472	5,656	12,128	5,700	4,919	10,619	1,046	6,082	4,436	584	7,760	7,760	75
Colima.....	1,741	1,253	3,004	1,110	1,214	2,324	35	1,817	1,348	204	2,054	1,608	135
Chiapas.....	1,510	1,284	2,794	.....	.....	.....	.....	.....	.....	.....	36	36	.....
Chihuahua.....	6,597	4,337	10,934	4,218	2,977	7,195	881	4,982	2,997	618	7,816	7,168	14
Durango.....	5,044	3,604	8,648	3,700	2,668	6,368	387	4,748	2,997	977	6,131	5,090	207
Guerrero.....	9,427	3,743	13,170	5,671	2,490	8,161	387	8,798	3,078	977	10,837	6,131	97
Guajaluto.....	17,837	13,687	31,524	11,397	8,090	19,487	221	21,090	9,317	211	22,777	11,884	268
Hidalgo.....	17,343	8,114	25,457	12,713	6,563	19,276	866	15,479	8,883	349	17,103	14,575	58
Jalisco.....	10,981	19,770	30,750	14,704	14,445	29,149	4,247	18,015	15,995	3,093	28,000	16,903	413
Michoacan.....	14,621	9,765	24,386	10,131	6,754	16,885	386	14,457	8,261	1,298	17,155	14,677	430
Morales.....	6,971	5,545	12,516	4,437	6,754	11,191	873	8,358	3,739	146	9,771	33	1
Morelos.....	13,159	7,390	20,549	9,492	5,951	15,443	.....	12,332	7,011	925	13,899	7,795	815
Nuevo Leon.....	54,713	12,181	66,894	30,880	4,665	35,545	1,086	33,117	17,060	958	37,490	32,144	564
Oaxaca.....	37,003	17,032	54,035	28,802	12,143	40,945	1,086	33,117	17,060	958	37,490	32,144	564
Puebla.....	3,795	1,417	5,212	2,886	1,062	3,948	.....	.....	47	78	3,384	2,995	129
Queretaro.....	13,930	11,359	25,289	10,882	8,777	19,659	4,066	7,137	10,506	2,086	18,590	14,724	1,033
San Luis Potosi.....	7,303	5,077	12,380	5,301	4,160	9,461	.....	4,093	5,715	2,632	9,334	8,150	307
Sinaloa.....	5,052	4,908	9,960	4,600	4,200	8,800	310	3,400	3,800	2,140	6,800	3,100	45
Sonora.....	1,165	1,630	2,795	1,491	861	2,352	128	2,548	1,746	353	67	58	125
Tabasco.....	3,768	3,388	7,156	3,766	2,078	5,844	103	4,666	4,053	318	5,961	4,042	129
Tamaulipas.....	7,996	3,720	11,716	7,300	3,002	10,302	2,138	4,863	7,907	862	12,846	12,572	133
Tlaxcala.....	9,106	4,098	13,204	9,652	4,491	14,143	842	4,863	7,907	862	12,846	12,572	133
Yucatan.....	15,791	12,181	27,972	11,263	8,211	19,474	1,045	15,515	8,612	2,663	12,893	12,604	434
Zacatecas.....	3,154	12,010	15,164	12,302	9,559	21,861	798	12,477	8,668	1,085	24,880	13,809	771
Federal District.....	931	927	1,858	1,141	1,540	2,681	90	3,344	1,061	82	2,777	1,648	50
Territory of Tepic.....	.....	157	157	172	1,540	1,712	.....	206	1,185	.....	1,434	671	.....
Lower California Territory, Southern District.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lower California Territory, Northern District.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	310,406	181,484	491,890	208,717	120,340	329,057	27,403	232,887	107,513	42,722	295,705	226,560	10,971

EDUCATION.
SCHOOLS SUPPORTED BY PRIVATE PARTIES.

STATES.	SCHOOLS SUPPORTED BY PRIVATE PARTIES.			SCHOOLS SUPPORTED BY THE CLERGY.			SCHOOLS SUPPORTED BY SOCIETIES.			ALUMNI INSCRIBED DURING THE YEAR.	
	Males.	Females.	Both sexes.	Total.	Males.	Females.	Both sexes.	Total.	Males.	Females.	Total.
Agascalientes.....	6	2	8	8	1	1	2	2	185	8	193
Campeche.....	4	4	8	8	1	1	2	2	82	83	165
Coahuila.....	37	25	62	75	4	1	5	5	1,473	1,473	2,946
Colima.....	...	...	...	24	3	2	5	5	66	708	1,368
Chiapas.....	...	...	...	...	1	1	2	2	...	...	...
Chihuahua.....	3	1	4	6	1	1	2	2	187	133	320
Durango.....	39	13	52	66	3	1	4	4	2,316	1,396	3,712
Guerrero.....	14	9	23	24	4	1	5	5	1,306	700	2,006
Guajaluto.....	63	47	110	110	...	...	...	...	1,307	2,351	3,658
Hidalgo.....	30	17	47	47	14	14	28	28	3,501	1,701	5,202
Jalisco.....	89	74	163	274	39	34	73	73	4,471	8,014	12,485
Michoacan.....	54	58	112	141	20	11	31	31	4,116	3,403	7,519
Morelos.....	10	5	15	23	3	1	4	4	804	570	1,374
Nevo Leon.....	52	31	83	93	8	1	9	9	2,030	1,308	3,338
Oaxaca.....	11	0	11	11	1	1	2	2	5,972	8,380	14,352
Puebla.....	27	12	39	53	12	6	18	18	4,515	2,112	6,627
Queretaro.....	14	10	24	43	4	...	4	4	1,867	828	2,695
San Luis Potosi.....	40	39	79	84	1	1	2	2	2,127	1,905	4,032
Sinaloa.....	10	5	15	15	...	...	...	...	...	...	...
Sonora.....	1	...	1	1	...	...	...	...	73	29	102
Tlaxcala.....	27	12	39	49	6	7	13	13	742	932	1,674
Tehuacan.....	24	8	32	42	...	...	...	...	708	486	1,194
Tlaxcala.....	11	8	19	29	...	...	...	...	2	2	4
Veracruz.....	...	...	...	...	...	...	...	...	427	528	955
Yucatan.....	56	46	102	139	7	...	7	7	1,438	347	1,785
Zacatecas.....	14	11	25	31	9	1	10	10	3,684	3,684	7,368
Federal District.....	2	3	5	10	5	5	10	10	1,594	1,166	2,760
Territory of Tepic.....	1	1	2	2	1	1	2	2	159	16	175
Lower California Territory, Southern District.....	...	...	...	...	...	...	...	...	...	...	...
Totals.....	659	460	697	1,816	141	92	43	276	56,657	44,683	101,340

EDUCATION.
SCHOOLS SUPPORTED BY PRIVATE PARTIES—Continued.

STATES.	MEDIUM ATTENDANCE DURING THE YEAR.			GRADES.			AGES.				ADVANCEMENT.			
	Males.	Females.	Total.	Primary.	Secondary.	Professional.	Total.	Five years.	From 5 to 10 years.	From 10 to 15 years.	Over 15 years.	Examined.	Passed.	Graduated.
Agua Calientes.....	119	14	133	8	1	...	0	14	36	50	62	286	221	7
Campeche.....	244	78	322	88	1	...	69	14	233	113	...	250	205	3
Coahuila.....	1,492	1,271	2,763	88	1	...	69	252	1,407	1,300	161	1,556	2,377	101
Colima.....	570	367	937	32	...	...	32	120	707	508	33	992	962	15
Chiapas.....	...	...	...	2	...	...	2	...	...	...	...	...	...	...
Chihuahua.....	132	112	244	4	5	...	9	...	...	...	...	...	...	...
Durango.....	2,004	1,094	3,098	86	1	...	82	7	103	133	77	253	233	300
Guerrero.....	798	284	1,082	27	1	...	29	539	2,073	1,205	225	2,699	2,571	44
Guatemala.....	3,109	2,225	5,334	110	...	...	110	407	691	537	362	1,509	1,145	...
Hidalgo.....	1,855	1,233	3,088	71	...	...	75	493	2,112	1,364	293	177	169	3
Jalisco.....	9,456	7,995	16,551	366	1	...	368	3,224	8,997	6,593	2,265	12,305	9,041	311
Michoacan.....	3,429	2,721	6,150	170	7	...	179	629	3,274	2,777	1,244	5,141	4,160	268
Morelos.....	638	507	1,145	26	2	...	28	148	855	404	69	1,296	1,107	...
Nuevo Leon.....	...	...	...	93	5	...	99	...	...	...	...	...	...	...
Oaxaca.....	1,482	939	2,421	93	...	...	93	2,256	4,358	4,581	3,106	1,807	1,107	61
Puebla.....	3,598	1,530	5,122	85	5	...	91	494	3,127	2,271	735	5,022	4,539	173
Queretaro.....	1,076	743	1,819	45	1	...	47	307	887	700	225	1,186	1,069	149
San Luis Potosi.....	2,079	1,806	3,975	445	...	...	445	...	...	...	...	...	...	...
Sinaloa.....	...	...	...	15	...	...	15	...	...	...	...	...	...	...
Sonora.....	60	25	85	4	...	...	4	...	...	...	...	...	...	...
Tabasco.....	652	860	1,512	58	...	...	58	152	859	610	71	...	...	...
Tamaulipas.....	504	347	851	48	...	...	48	61	684	497	22	651	538	6
Tlaxcala.....	367	219	586	26	...	...	26	122	384	130	44	523	428	16
Yucatan.....	1,216	1,661	2,877	43	3	...	47	186	543	1,060	167	1,734	1,007	228
Zacatecas.....	3,018	2,393	5,411	150	1	...	152	377	3,613	2,595	441	5,446	4,393	263
Federal District.....	1,220	1,246	2,466	42	...	...	42	327	1,889	950	97	1,977	1,812	98
Territory of Tepic.....	1,111	867	1,978	45	...	...	45	259	1,454	872	85	2,151	1,170	6
Lower California Territory, Southern District.....	103	13	116	5	...	...	5	...	...	...	...	...	...	...
Totals.....	40,135	28,744	68,879	2,193	34	11	2,238	10,413	38,350	20,208	9,872	47,413	38,121	2,099

PUBLIC LIBRARIES IN MEXICO.

STATES.	NAME OF LIBRARY.	WHERE LOCATED.	NUMBER OF VOLUMES.	ANNUAL NUMBER OF STU- DENTS.	HOW SUPPORTED.
Aguascalientes	Scientific Institute.	Aguascalientes	3,668	1,037	State funds.
Campeche	Campeche Institute.	Campeche	3,408	150	Institute funds.
"	Carmelita Lyceum.	Carmen	1,194	585	Carmelita Lyceum funds.
Coahuila	Melchor Ocampo.	"	2,102	4,400	Miguel Hidalgo School funds.
"	State	Saltillo.	355	.....	State funds.
"	Commercial	"	350	.....	School funds.
Colima	Public	Colima	3,322	.....	Government funds.
"	Parochial "Christopher Columbus"	"	3,450	.....	Clergy funds.
"	Seminary	"	.....	.....	"
Chiapas	Preparatory School.	San Cristóbal.	2,563	775	Federal Government funds.
Chihuahua	Public.	Tapachula.	1,090	.....	"
"	Franklin Society	Chihuahua	490	.....	Franklin Society funds.
"	Literary Institute.	"	5,000	6,000	Institute funds.
"	San Francisco College.	"	10,000	.....	College funds.
Durango	Juárez Institute.	Durango.	159,000	.....	State funds.
Federal District	National.	Mexico	2,000	.....	Federal Government funds.
"	Preparatory School.	"	14,000	.....	"
"	Commercial	"	2,000	.....	"
"	Law	"	2,000	.....	"
"	Fine Arts	"	7,000	.....	"
"	Engineering	"	4,000	.....	"
"	Agricultural	"	3,000	.....	"
"	Medical	"	2,000	.....	"
"	Museum of Natural History.	"	4,000	.....	"
"	Geographical and Statistical Society.	"	1,000	.....	"
"	Judicial Archives.	"	8,000	.....	"
"	General Archives.	"	400	.....	"
"	Normal School for Men.	"	1,021	.....	"
"	Normal School for Women.	"	.....	.....	"
"	Conservatory of Music.	"	.....	.....	"

PUBLIC LIBRARIES IN MEXICO—Continued.

Federal District.	Arts and Trades for Men.	Mexico	.....	.....	Federal Government funds.
Guanaajuato	State College.	Guanaajuato	12,500	10,900	State funds.
Guerrero	Literary Institute.	Chilpancingo	2,346	8,400	" "
Hidalgo	Scientific and Literary Institute.	Pachuca	2,628	.....	" "
Jalisco	State.	Guadalajara.	.....	16,000	" "
Mexico.	Municipal.	Cuautitlan.	300	15	Special donations.
"	"	Coyotepec	38	5	" "
"	"	Ixtlahuaca.	36	15	" "
"	"	San Felipe del Progreso.	27	20	" "
"	"	Mineral del Oro.	13	15	" "
"	"	Jilotepec	25	10	" "
"	"	Lerma	130	20	" "
"	Benito Juárez.	Orumba	77	25	" "
"	Municipal.	Sultepec	16	9	" "
"	"	Saculápan	15	14	" "
"	"	Texcaltlan.	16	14	" "
"	"	Temascaltepec	64	12	" "
"	"	Tejupilco.	56	12	" "
"	"	San Simon de Guerrero.	87	12	" "
"	Scientific Institute.	Toluca	13,700	12	" "
"	Municipal	Bravo Valley.	25	10	" "
"	"	Asuncion Malacatepec.	62	4	" "
"	"	Tenango Valley.	45	4	" "
"	"	Guerrero Valley.	10	12	" "
Michoacan.	Public	Morelia	13,922	8,864	§ 1 tax on the estate of deceased persons.
"	San Nicolás College.	"	.....	.....	College funds.
"	Seminary	"	30,000	3,000	Special donations.
"	Compañia College.	Pátzcuaro.	1,000	200	" "
"	Uruapan.	Uruapan.	333	43	Municipal funds.
"	Seminary	Zamora	7,000	1,392	Special donations.
Morelos	Public	Cuernavaca.	2,348	.....	State funds.
"	Yauatepec	Yauatepec	30	"	" "
"	Morelos	Cautla	522	"	" "
"	Tetecala	Tetecala.	225	"	" "
"	Jojutla.	Jojutla.	352	"	" "
Nuevo Leon.	Public	Monterey	3,458	"	" "
Oaxaca.	Public	Oaxaca	15,000	"	" "

PUBLIC LIBRARIES IN MEXICO—Continued.

Puebla.....	Palafoxiana.....	Puebla.....	27,000	4,000	State funds.
".....	Lafragua.....	".....	21,000	15,012	".....
".....	Serrano.....	Atlixco.....	200	80	Special donations.
".....	Benito Juárez.....	Zacatlan.....	400	2,408	".....
".....	Manuel M. Flores.....	Chalchicomula.....	350	100	Political Prefect donations.
".....	" Porfirio Díaz " Municipal.....	Matamoros Izucar.....	500	50	Municipal funds.
Querétaro.....	Civil College.....	Querétaro.....	7,743	.....	".....
San Luis Potosí.....	State.....	San Luis Potosí.....	13,751	20,345	State funds.
Sinaloa.....	".....	Culiacan.....	3,000	495	".....
Sonora.....	".....	Hermosillo.....	4,714	4,870	".....
".....	Sonora College.....	".....	800	.....	".....
".....	Board of Public Instruction.....	Guaymas.....	1,138	.....	Junta.....
".....	Education Society.....	Sahuaripa.....	800	.....	State.....
Tabasco.....	Juárez Institute.....	San Juan Bautista.....	165	.....	".....
".....	José Eduardo Cárdenas.....	".....	1,800	.....	".....
Tamaulipas.....	State.....	Ciudad Victoria.....	1,650	3,600	".....
".....	Juárez Society.....	Matamoros.....	500	.....	Juárez Society funds.
Tlaxcala.....	General Archives.....	Tlaxcala.....	11,030	.....	State funds.
Veracruz.....	Pueblo.....	Veracruz.....	13,995	3,000	".....
".....	Public.....	Tlaxotlán.....	333	1,100	Municipal funds.
".....	Preparatory College.....	Orizaba.....	9,704	.....	".....
".....	Preparatory ".....	Córdoba.....	805	.....	State funds.
".....	Normal School.....	Jalapa.....	697	.....	".....
".....	Preparatory College.....	".....	1,377	.....	".....
".....	Seminary.....	Papantla.....	2,796	.....	".....
".....	Gabino Barreda.....	Tantoyuca.....	97	.....	".....
".....	".....	".....	824	.....	".....
Yucatan.....	Benito Juárez.....	".....	400	.....	".....
".....	Cepeda.....	Mérida.....	2,317	7,300	Special funds.
".....	Iturralde.....	Valladolid.....	200	720	".....
".....	Catholic College.....	Mérida.....	4,000	.....	".....
".....	Eulogio Ancona.....	Progreso.....	445	340	".....
".....	Traconis.....	Ticul.....	300	.....	".....
Zacatecas.....	Public.....	Zacatecas.....	22,000	10,000	State donations.
".....	".....	Fresnillo.....	2,000	50	".....
Lower California Territory.....	Municipal.....	La Paz.....	700	50	Municipal funds.

Statistical Notes on Mexico.

SUMMARY OF FACTORIES EXISTING IN MEXICO IN 1893.

STATES.	Cotton and wool- len mills.	Brandy.	Mescal.	Beer.	Chemical pro- ducts.	Chocolate.	Paper.	Soap.	Tobacco.	Matches.	Powder.	Cake and crack- ers.	Pottery.	China.	Glass.	Starch.	Cotton gins.	Candles.	Artificial stone, bricks, tiles, etc.	Ice.	Grape wine.	Total.
Federal District.....	13	.....	.....	8	11	8	5	16	22	91	.....	13	.....	2	9	7	.....	118	52	3	.....	125
Aguascalientes.....	3	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Campeche.....	37	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chiapas.....	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chihuahua.....	13	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Coahuila.....	6	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colima.....	3	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Durango.....	3	24	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Guajaluto.....	8	47	3	.....	.....	.....	.....	8	4	1	.....	7	2	.....	.....	.....	5	.....	.....	.....	.....	.....
Guerrero.....	1	77	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hidalgo.....	7	191	9	.....	.....	.....	.....	46	4	4	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Jalisco.....	4	111	6	6	1	1	2	21	4	2	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Michoacan.....	2	178	6	8	.....	.....	.....	24	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mexico.....	15	44	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morelos.....	1	40	4	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nuevo Leon.....	2	606	4	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oaxaca.....	2	88	33	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Puebla.....	19	515	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Queretaro.....	4	82	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Luis Potosi.....	2	213	36	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sinaloa.....	2	147	14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sonora.....	1	71	66	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tabasco.....	.....	21	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tamaulipas.....	.....	13	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tlaxcala.....	5	17	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Veracruz.....	5	137	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yucatan.....	.....	42	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Zacatecas.....	.....	58	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Territory of Tepic.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Territory of Lower Cali- fornia.....	2	31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Territory of Upper Cali- fornia.....	1	69	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total.....	123	2,899	276	31	112	16	10	146	14	28	1	35	8	3	7	9	10	126	27	9	9	3,800

MANUFACTURING ESTABLISHMENTS IN MEXICO IN 1893.

I take from *Les Finances des Etats-Unis Mexicains* of Mr. Prosper Gloner the following table, which purports to give the number of some of the manufacturing establishments in Mexico during the year 1893. Mr. Gloner acknowledges that his table is very deficient, as he says in a note that appears at the foot of it that he failed to receive the data from 117 districts in different states of Mexico, and that besides the manufacturing establishments mentioned in his table there are in the City of Mexico the following: (See page 236.)

Carriages and wagons.....	11
Wax works.....	28
Agricultural implements.....	9
Wall paper.....	1
Coloring substances.....	2
Mineral and soda-waters.....	4
Carriage varnishes.....	2
Jewelry boxes, etc.....	9
Mucilage and paste.....	11
Card-board.....	6
Scientific instruments.....	1
Playing cards.....	1
Pianos, organs, and harmonicas.....	4
Passementeries.....	6
Type foundries.....	1
Gold and silver ribbons.....	2
Perfumeries.....	6
Hats.....	49
Musical instruments.....	6
Total.....	159

NAVIGATION.

The total number of vessels, both steamers and sailing vessels, which arrived at and departed from Mexican ports during the year 1895, appears in the following statement.

I also append a statement showing the number of passengers who arrived in and departed from Mexico by sea and rail during the year 1895, mentioning both their nationality and the port of their arrival. The number appears exceedingly small when compared with the very large number coming from Europe to the United States; but I feel sure that before long we will have a large immigration.

Statistical Notes on Mexico.

VESSELS ARRIVED AT MEXICAN PORTS IN 1895.

COUNTRIES.	TOTAL NUMBER.			STEAMERS.			SAILING VESSELS.			LOADED.			IN BALLAST.		
	Ves- sels.	Tons.	Crew.	Ves- sels.	Tons.	Crew.	Ves- sels.	Tons.	Crew.	Ves- sels.	Tons.	Crew.	Ves- sels.	Tons.	Crew.
Mexican ports.....	4,049	1,757,700 58	77,390	2,406	1,635,634 69	68,391	1,636	102,065 89	8,899	3,399	1,532,227 11	66,422	713	225,473 47	10,868
United States.....	466	397,050 07	12,393	317	360,486 20	11,214	149	36,369 87	1,686	468	382,915 92	11,516	58	14,134 10	767
Colombia.....	14	20,569 34	407	11	19,561 66	440	3	947 68	27	11	19,561 66	440	3	947 68	27
Venezuela.....	15	5,717 59	140	1	1,367 00	22	14	4,330 99	118	3	1,795 35	35	12	3,992 24	105
Brazil.....	31	11,121 90	286	.....	.....	.....	31	11,121 90	286	.....	.....	.....	31	11,121 90	286
Guatemala.....	35	53,720 25	2,384	32	53,064 35	2,249	3	655 90	35	28	46,394 99	1,019	7	7,415 26	305
Norway.....	10	7,482 81	199	1	1,624 00	24	15	6,458 81	175	.....	.....	.....	16	7,482 81	199
Honduras.....	1	186 00	9	.....	.....	.....	1	186 00	9	.....	.....	.....	.....	186 00	9
Costa Rica.....	2	9,641 95	907	8	9,086 00	191	2	555 95	16	8	9,086 00	191	2	555 95	16
Antilles.....	2	912 00	22	.....	.....	.....	2	912 00	22	.....	.....	.....	2	912 00	22
Chili.....	1	446 00	11	.....	.....	.....	1	446 00	11	.....	.....	.....	.....	446 00	11
Hayti.....	8	12,126 15	326	8	12,126 15	326	.....	.....	.....	.....	.....	.....	.....	.....	.....
Holland.....	5	1,810 56	49	.....	.....	.....	5	1,810 56	49	.....	.....	.....	.....	1,810 56	49
Italy.....	7	8,804 00	184	7	8,804 00	184	.....	.....	.....	.....	.....	.....	.....	8,804 00	184
England.....	226	217,085 31	4,215	80	137,593 22	2,547	146	70,552 09	1,668	114	181,443 77	3,280	112	35,611 54	935
Germany.....	36	47,882 01	1,012	23	36,706 22	821	13	11,175 79	191	32	46,406 69	975	4	1,421 31	37
Belgium.....	6	7,930 00	138	5	7,572 00	127	1	358 00	11	6	7,930 00	138	.....	.....	.....
France.....	30	27,073 24	2,191	12	21,944 00	2,023	18	6,009 24	168	15	22,732 90	2,049	15	5,220 34	142
Spain.....	202	345,314 42	11,426	160	338,264 11	11,084	42	7,090 31	342	155	399,517 91	10,062	47	15,796 51	464
Australia.....	4	3,476 67	72	.....	.....	.....	4	3,476 67	72	.....	.....	.....	.....	1,454 07	31
Africa.....	3	807 52	25	.....	.....	.....	3	807 52	25	.....	.....	.....	.....	807 52	25
Argentine Republic.....	2	1,115 23	25	.....	.....	.....	2	1,115 23	25	.....	.....	.....	.....	1,115 23	25
Portugal.....	2	687 32	19	.....	.....	.....	2	687 32	19	.....	.....	.....	.....	687 32	19
Unknown.....	10	7,074 50	167	6	5,223 50	125	4	1,851 00	42	8	6,637 50	151	2	437 00	16
Totals.....	5,174	2,046,545 42	113,070	3,077	2,668,381 10	99,768	2,097	278,164 32	13,302	4,135	2,609,962 60	98,640	1,099	336,582 82	14,430

VESSELS DEPARTED FROM MEXICAN PORTS IN 1895.

COUNTRIES.	TOTAL NUMBER.			STREAMERS.			SAILING VESSELS.			LOADED.			IN BALLAST.		
	Ves- sels.	Tons.	Crew.	Ves- sels.	Tons.	Crew.	Ves- sels.	Tons.	Crew.	Ves- sels.	Tons.	Crew.	Ves- sels.	Tons.	Crew.
Mexican ports.....	4,100	1,807,250 18	77,049	8,454	1,705,904 55	69,243	1,655	101,915 63	8,669	2,880	1,304,609 85	58,770	1,220	412,350 33	10,178
United States.....	548	544,768 74	13,685	411	489,904 13	12,060	137	55,204 61	1,225	345	437,468 44	10,502	203	107,300 30	3,003
Colombia.....	4	4,167 80	106	2	4,167 80	106	1	287 00	10	15	1,081 75	1,184	10	3,086 05	134
Guatemala.....	31	57,619 30	2,085	30	57,332 30	2,075	1	287 00	10	15	26,598 51	1,184	10	31,026 70	901
Honduras.....	2	548 00	20	2	548 00	20	1	287 00	10	15	26,598 51	1,184	10	31,026 70	901
Costa Rica.....	1	548 00	15	1	548 00	15	1	287 00	10	15	26,598 51	1,184	10	31,026 70	901
Nicaragua.....	1	548 00	15	1	548 00	15	1	287 00	10	15	26,598 51	1,184	10	31,026 70	901
Italy.....	3	603 36	14	3	603 36	14	1	287 00	10	15	26,598 51	1,184	10	31,026 70	901
England.....	169	85,583 45	2,114	16	20,070 00	556	153	55,613 45	1,458	150	80,315 45	1,950	10	5,068 00	164
Germany.....	34	39,708 00	985	21	37,483 00	829	13	4,923 00	126	34	39,708 00	985	10	5,068 00	164
Belgium.....	1	1,565 00	29	1	1,565 00	29	1	1,565 00	29	1	1,565 00	29	1	1,565 00	29
France.....	39	24,757 09	1,583	7	13,779 88	1,265	32	11,477 30	390	38	24,335 09	1,573	41	604 00	10
Russia.....	193	333,554 71	11,468	160	338,160 15	11,445	33	3,374 26	246	158	317,339 43	10,931	41	10,313 28	557
Spain.....	21	12,104 48	276	21	12,104 48	276	21	12,104 48	276	19	6,984 00	194	2	5,120 48	82
Ecuador.....	1	241 67	9	1	241 67	9	1	241 67	9	1	241 67	9	1	241 67	9
Unknown.....	2	954 00	13	2	954 00	13	2	954 00	13	2	954 00	13	2	954 00	13
Totals.....	5,159	2,975,230 54	110,494	3,106	2,666,644 76	97,954	2,053	248,605 78	12,540	3,658	2,330,449 48	86,301	1,521	584,781 06	24,193

RÉSUMÉ OF THE YEARS 1885 TO 1895.

Year.	ARRIVED.			DEPARTED.		
	Total number of vessels.	In-crease.	De-crease.	Total number of vessels.	In-crease.	De-crease.
1885.....	4,436	.....	.....	4,396	.....	.....
1886.....	4,741	.....	.....	4,687	.....	.....
1887.....	5,123	.....	.....	5,076	.....	.....
1888.....	5,428	.....	.....	5,293	.....	.....
1889.....	5,220	.....	.....	5,055	.....	.....
1890.....	5,164	.....	.....	4,918	.....	.....

FOREIGN PASSENGERS ARRIVED AT MEXICAN PORTS IN 1895.
GULF PORTS.

PORTS.	Total number of passengers.	NATIONALITY.															WHERE THEY CAME FROM.											
		Mexicans.	Americans.	Chilians.	English.	French.	Germans.	Chinese.	Italians.	Spanish.	Russians.	Swiss.	Austrians.	Turks.	Colombians.	Other nation- alities.	Spain.	United States.	England.	France.	Guatemala.	Germany.	Italy.	Costa Rica.	Colombia.	Belgium.	Salvador.	Other nations.
Alvarado.....	2	1				1											1	2										
Campeshe.....	1																											
Coatzacoalcas.....	13	3			1	2	2			1								13										
Frontera.....	1																	6	1									
Isla del Carmen.....	601	55	16	7	5	45	4	95	4	95		1	48				493	104	4					1				
Progreso.....	447	35	74	18	13	11	205	7	40	97			1			43	999	97	4	3		1					43	
Tampico.....	9	8																9										
Tuxtepec.....	4,072	170	456	5	214	445	104	21	170	2,285		33	10	62	3	34	2,472	732	191	597		52	1		20	7		
Veracruz.....																												
Total.....	5,153	334	597	5	290	468	182	271	281	2,628		36	11	110	3	77	3,271	957	200	600		53	1	1	20	7	43	

PACIFIC PORTS.

PORTS.	Total number of passengers.	NATIONALITY.												WHERE THEY CAME FROM.														
		Mexicans.	Americans.	Chilians.	English.	French.	Germans.	Chinese.	Italians.	Spanish.	Russians.	Swiss.	Austrians.	Turks.	Colombians.	Other nation- alities.	Spain.	United States.	England.	France.	Guatemala.	Germany.	Italy.	Costa Rica.	Colombia.	Belgium.	Salvador.	Other nations.
Acapulco.....	59	22	10		3		12		3							9		37	1		21							
Guaymas.....	24	11			4	2		7										20	4									
La Paz.....	21	5	8		2	3	3											187			9							
Mazatlan.....	196	107	59	7	1	4	10	7	1									1										
Puerto Angel.....	1																	1										
San Blas.....	15	2	5			2	3						1			2		13			2							
San José del Cabo.....	1																	4										
Salina Cruz.....	87	24	8					55										4			25							58
Santa Rosa.....	12	7	2		3													9	2			1						
Tonalá.....	7	7																			6							
Todos Santos.....	603	179	357		39	9	1	8	10									603										
Total.....	1,026	353	462	7	52	20	20	77	13	1			1			11		897	7		63	1						58

GENERAL RÉSUMÉ.

	Total number of passengers.	NATIONALITY.															DESTINATION.											
		Mexicans.	Americans.	Chilians.	English.	French.	Germans.	Chinese.	Italians.	Spanish.	Russians.	Swiss.	Austrians.	Turks.	Colombians.	Other nation- alities.	Spain.	United States.	England.	France.	Guatemala.	Germany.	Italy.	Costa Rica.	Colombia.	Belgium.	Salvador.	Other nations.
Arrived.....	6,179	687	1,050	12	302	488	211	348	104	2,629	....	36	12	110	3	88	3,271	1,854	207	600	63	54	1	1	20	7	43	58
Departed.....	3,874	769	786	....	128	364	112	65	87	1,420	2	16	10	83	1	31	1,804	1,550	54	433	17	14	....	....	....	....	....	2
Total.....	10,053	1,456	1,835	12	430	852	323	413	281	4,049	2	52	22	193	4	119	5,075	3,404	261	1,033	80	68	1	1	20	7	43	60
Difference.....	2,305	88	273	12	174	124	99	283	107	1,209	2	20	2	27	2	57	1,467	304	153	167	46	40	1	1	20	7	43	56
Passengers arrived by the Central Railroad during 1895.....																												9,991
" " " National Railroad during 1895.....																												3,387
" " " International Railroad during 1895.....																												3,238
Passengers departed by the Central Railroad during 1895.....																												9,589
" " " National Railroad during 1895.....																												3,126
" " " International Railroad during 1895.....																												2,691
Total of passengers arrived and departed by rail in 1895.....																												16,916
Difference between passengers arrived and departed by railroads in 1895.....																												15,406
Passengers arrived by the ports.....																												32,022
" " " railroads.....																												1,210
Passengers departed by the ports.....																												6,179
" " " railroads.....																												3,874
Total of passengers arrived and departed by ports and rail in 1895.....																												42,075
Difference between passengers arrived and departed by ports and railroads in 1895..																												3,515

VESSELS ARRIVED AT AND DEPARTED FROM MEXICAN PORTS DURING
THE FISCAL YEARS 1894-95 TO 1895-96.

	ARRIVED.				DEPARTED.			
	Steamers.		Sailing vessels.		Steamers.		Sailing vessels.	
	Ves- sels.	Ton- nage.	Ves- sels.	Ton- nage.	Ves- sels.	Ton- nage.	Ves- sels.	Ton- nage.
Total navigation in the fiscal year 1894-1895.....	4,078	3,083,050	5,497	345,923	3,399	3,026,964	5,566	332,720
Total navigation in the fiscal year 1895-1896.....	4,471	3,300,444	5,723	395,041	4,378	3,242,711	5,856	390,765
Difference.....	393	217,394	226	49,118	979	215,747	290	58,045

AGRICULTURAL PRODUCTS.

I take from the *Anuario Estadístico de la Republica Mexicana* of 1895 the following table, which gives the total production of some of our agricultural staples, although I feel perfectly satisfied that they are very much under-rated in said table, because of the difficulty in obtaining complete data about our agricultural productions, both for want of a proper machinery to collect it, and because manufacturers conceal the extent of these products for the purpose of avoiding taxation. I think if the figures in said table are duplicated they will be nearer the true production.

RÉSUMÉ OF AGRICULTURAL PRODUCTS IN MEXICO.

ARTICLES.	BUSHEL.	POUNDS AND OTHER MEASURES.	VALUE.
Cereals :			
Rice.....		27,174,320 59	\$ 1,400,299 40
Barley.....	4,752,239		3,587,682 65
Indian corn.....	71,900,598		75,695,383 21
Wheat.....	10,034,328		13,273,790 50
Leguminous :			
Chickling vetch (Arvejon)...	251,230		336,771 40
Beans.....	4,319,834		7,260,123 25
Chick-peas.....	774,351		932,608 60
Lima beans.....	561,159		624,530 22
Lentils.....	34,123		64,441 25
Root plants :			
Sweet potatoes.....	2,051,854		859,461 50
Huacamote.....	235,939		108,348 82
Potatoes.....		29,472,894 45	879,430 15
Solanaceous :			
Dried pepper.....		9,724,443 98	1,731,857 67
Green pepper.....	1,007,049		758,199 90
Cane products :			
Sugar cane.....		5,924,612,232 56	25,692,281 25
Sugar.....		316,531,239 02	10,283,994 38
Brown sugar.....		152,300,903 95	7,942,787 60
Molasses.....		12,748,079 24	3,304,787 82

ARTICLES.	BUSHELS.	POUNDS AND OTHER MEASURES.	VALUE.
Oleaginous :			
Sesame seed.....	214,469	.....	\$ 144,773 00
Peanuts.....	357,569	.....	325,413 00
Coquito de Aceite.....	69,388	.....	130,955 00
Cocoanuts.....	.....	(310,953,000 cocoanuts)	3,522,789 00
Linseed.....	303,425	.....	373,115 00
Palma Christi.....	59,460	.....	83,434 00
Turnip seed.....	20,708	.....	34,806 00
Lime-leaf sago.....	9,968	.....	20,168 00
Alcohol and Fermented Drinks:			
Rum.....	.....	12,768,716 gals.	5,056,474 82
Pulque whiskey.....	.....	270,876 gals.	199,935 00
Mezcal.....	.....	6,011,602 gals.	3,078,372 00
Pulque.....	.....	54,624,835 gals.	3,562,435 05
Tlachique or unfermented pulque.....	.....	24,013,901 gals.	1,294,575 00
Textiles:			
Henequen.....	.....	93,427,740 04	4,104,096 00
Ixtle.....	.....	9,608,026 79	325,250 95
Cotton.....	.....	78,511,486 26	10,176,050 50
Grape Products:			
Grape.....	.....	3,114,519 05	161,372 25
Wine.....	.....	162,816 16 gals.	146,028 70
Brandy.....	.....	91,656 69 gals.	83,724 80
Dyeing Plants:			
Indigo.....	.....	299,761 56	285,530 00
Brazil.....	.....	632,135 85	64,795 00
Campeachy.....	.....	171,604,086 41	2,110,098 50 —
Moral.....	.....	19,826,253 38	195,300 00
Tanning Plants:			
Cascalote.....	.....	4,798,994 96	242,070 25
Tanning bark.....	.....	33,036,812 04	457,167 26
Tropical Plants:			
Cocoa.....	.....	5,346,718 17	1,123,180 00
Coffee.....	.....	42,019,015 76	11,565,519 28
Tobacco.....	.....	124,852,597 69	6,464,733 50
Pepper.....	.....	119,273 60	14,055 00
Vanilla.....	.....	(10,714,000 vanilla beans)	667,145 50
Gums:			
Chewing gum.....	.....	3,996,630 32	549,865 50
India rubber.....	.....	1,354,851 48	410,290 00
Mesquite gum.....	.....	139,896 97	7,292 75
Copal gum.....	.....	21,485 47	10,313 55
Medicinal Plants:			
Jalap.....	.....	50,099 00	6,945 00
Sarsaparilla.....	.....	1,514,331 90	100,730 00

CONCLUSION.

It has taken me a great deal of time and required a great deal of effort to obtain and prepare the data contained in this paper. I am sorry I have not been able to make it more complete than it is ; but I hope my article, by giving a general and superficial idea of Mexico, may promote the desire to read other papers and books treating on that subject in a fuller and more complete manner.

ADDENDA.

Since this paper has been printed the Federal Treasury of Mexico finished the accounts of the fiscal year ended June 30, 1897, and I give below the general results, showing the total amount of the Federal revenues and expenses during that year. I also give a statement, taken from the Statistical Bureau of the Treasury Department of Mexico, published since this paper has gone to press, of the imports and exports in the same year, both by countries and custom houses, these two statements completing the data contained in this paper, and finally some data of the trade of both countries during the first nine months of the present calendar year.

FEDERAL REVENUE AND EXPENSES OF MEXICO IN THE FISCAL YEAR 1896-1897.

RECEIPTS.

Duties on imports and exports.....	\$23,639,580.91	
Internal revenue.....	24,323,798.46	
Public services.....	2,057,409.92	
Extraordinary and incidental.....	2,084,496.30	
	<hr/>	
		\$52,105,285.59
Extraordinary revenues proceeding from contracts and other sources		<hr/> 2,819.17
		<hr/> \$52,108,104.76

EXPENSES.

1. Legislative power.....	\$ 989,758.38	
2. Executive power.....	62,100.26	
3. Judicial power.....	428,687.46	
4. Department of Foreign Affairs.....	470,122.37	
5. Department of Interior.....	3,354,888.95	
6. Department of Justice and Public Education.	2,184,556.52	
7. Department of Fomento, Colonization, and Industry.....	611,863.83	
8. Department of Communications and Public Works.....	5,494,593.34	
9. Department of the Treasury and Public Credit.....	24,218,207.75	
10. Department of War and the Navy.....	10,550,955.18	
	<hr/>	
Total.....		\$48,365,734.04
Surplus		<hr/> <hr/> \$3,742,370.72

**IMPORTS AND EXPORTS OF MEXICO BY COUNTRIES AND CUSTOM
HOUSES IN THE FISCAL YEAR 1896-97.**

COUNTRIES.	IMPORTS.	EXPORTS.	CUSTOM HOUSES.	IMPORTS.	EXPORTS.
Algiers.....	\$ 802		Acapulco	\$ 206,275	\$ 123,481
Arabia.....	282		Altata.....	101,159	813,899
Argentina			Camargo.....	6,897	8,735
Republic..	1,897		Campeche....	175,027	747,710
Australia....	24,833		City of Juarez..	2,910,359	17,929,521
Austria.....	128,367		City of Porfirio		
Belgium.....	479,850	\$ 1,134,325	Diaz.....	4,710,415	2,888,535
Bolivia.....	214		Coatzacoalcas..	105,148	285,195
Brazil.....	240		Frontera.....	246,918	418,352
Canada.....	3,356	17	Guaymas.....	451,959	40,307
Chili.....	6,203	20	Guerrero.....	6,863	15,754
China.....	51,357	5,396	Isle of Carmen	89,894	1,693,767
Colombia....	64,317	17,675	La Morita....	24,943	498,765
Costa Rica ..		31,658	La Paz.....	62,937	430,144
Cuba.....	363	53,503	Laredo.....	4,693,818	3,701,086
Denmark....	3,614		Las Palomas..	18,794	420,011
Ecuador.....	53,249		Manzanillo...	77,395	221,551
Egypt.....	10,271		Matamoros....	185,370	312,987
England.....	6,881,701	14,280,527	Mazatlan....	1,572,568	5,808,037
France.....	4,989,082	1,873,522	Mier.....	8,157	78,609
Germany.....	4,003,203	4,416,744	Nogales.....	944,312	5,776,575
Greece.....	1,660		Progreso.....	1,463,515	8,443,130
Guatemala..	46,323	1,197,247	Puerto Angel..	15,150	525,075
Hawaii.....		1,200	Salina Cruz...	11,676	68,114
Holland.....	132,728	57,906	San Blas.....	152,643	638,398
Honduras....	3		Sta. Rosalia..	547,726	3,279,390
India.....	210,845		Soconusco....	231,078	1,608,446
Italy.....	184,186	10,765	Tampico.....	8,773,275	29,952,441
Japan.....	23,673	1,660	Tijuana.....	14,297	116,238
Nicaragua...		2,110	Todos Santos..	140,268	199,367
Norway.....	41,670		Tonala.....	106,494	255,582
Persia.....	784		Tuxpam.....	76,926	1,154,313
Peru.....	108	19,690	Veracruz.....	14,036,136	22,484,633
Portugal....	22,653		Zapaluta.....	35,703	408,346
Russia.....	31,387	294,165			
Salvador....	452	12,185			
San Domingo	1,071				
Senegambia..	902				
Spain.....	1,983,794	1,192,328			
Sweden.....	29,078	180			
Switzerland..	163,293	720			
Turkey.....	3,267				
United States	22,593,860	86,742,951			
Uruguay.....	33				
Venezuela...	27,608				
Zanzibar....	1,456				
Total....	\$42,204,095	\$111,346,494	Total.....	\$42,204,095	\$111,346,494

A comparison between the foreign trade in the fiscal year 1896-97 with the year before, 1895-96, gives the following results: During the year 1896-97 Mexico's exports increased \$6,329,592, but the value of the exports sent to the United States increased \$7,091,256. The

total of Mexico's imports for the year 1896-97 shows a falling-off of \$49,843, but, notwithstanding this fact, Mexico's imports from the United States increased \$2,448,097. During the year England's exports to Mexico decreased \$1,023,315, and her imports from Mexico show a loss of \$2,186,622, a combined loss of over 12 per cent. in her commercial relations with the Republic. Imports to Mexico from France fell off \$1,110,101, a loss of one-sixth of all France's exports to Mexico. In 1895-96 the United States imported 75.8 per cent. of the total exports from Mexico; in 1896-97 American exporters furnished 53½ per cent. of all that Mexico bought abroad, and, more than this, the United States took 47.67 per cent. of all that was exported from Mexico. These figures sustain the prediction made, that any unsettlement or diminution of Mexico's importations either because of fluctuating silver or the increased production of home manufactures would affect American exporters less than those of any other country. The statistics given above show that these causes have affected them less than those of all the other countries combined; in fact, their loss has been the gain of the United States.

TRADE BETWEEN MEXICO AND THE UNITED STATES DURING THE
FIRST NINE MONTHS OF THE CALENDAR YEAR 1897.

The following data, taken from the publications of the Statistical Bureau of the United States Treasury Department, shows the results of the trade with Mexico in the nine months ended September 30, 1897, as compared with the similar period ended September 30, 1896.

Mexican Exports to the United States.—In the following items the first group of figures represents the amounts and values exported in the first nine months of this year, and the second those of the similar period in 1896:

Coffee, 30,016,967 pounds, worth \$4,574,252 gold, against 19,715,264 pounds, worth \$3,333,385. The much lower price of coffee this year accounts for the disproportionate valuation.

The people of the United States, besides being Mexico's chief customers for coffee, are buying more and more of our tobacco, which they now know and appreciate on its merits. The amount exported to the United States was 600,987 pounds, worth in gold \$294,536, against 191,303, worth \$78,769.

Mexico exported, in the period under consideration, to the United States, hides and skins to the value of \$1,534,306 gold, against \$1,055,299. The quantities, respectively, were 11,764,000 pounds, and 7,102,465 pounds. No diminution of activity there.

It is worth noting that oranges were shipped out to the value of \$22,444 gold against \$19,359.

Mexico's great argentiferous lead business did not fall behind, the nine months' exportation being 108,776,560 pounds, worth in gold \$1,226,525, against 97,818,833 pounds, worth \$949,926. The bulk of the American purchase of lead is from Mexico.

Yucatan is Mexico's henequen-growing region, and the exportation has been heavy, standing at 48,410 tons, worth in gold \$2,889,003, against 35,746 tons, worth \$2,323,585, a noteworthy increase. The henequen or sisal-grass trade into the United States is overwhelmingly Mexican, "other countries" furnishing but 399 tons in the first nine months of this year!

Mexico both exports and imports coal, and shipped into the United States 85,890 tons, worth in gold \$182,416, against 52,674 tons, worth \$115,015.

Logwood exports were \$44,028, against \$15,250.

Mahogany fell off, being \$290,044 gold, against \$306,715, but this trade is always variable.

Mexican Imports from the United States.—It is worthy of note that, in spite of the extraordinarily heavy gold premium, Mexico should be increasing her buying abroad of electrical apparatus, the purchase from the United States alone, in the first nine months of this year, amounting to \$228,000 gold, as against \$200,000 in the same period last year. Sewing machines went in to the value of \$164,000 gold in the nine-month period, against \$154,000 last year. Builders' hardware fell off from \$556,600 gold value, in the first nine months of last year, to \$424,000 this year, but lumber for builders ran up to \$1,079,000 gold, against only \$544,000 last year, all coming from the United States. Furniture increased slightly, \$141,000 gold, against \$126,000.

Carriages, cars, and other vehicles, in the nine-months' period, came from the United States to the value of \$664,000 gold, as compared with \$463,000 last year. Bicycles amounted to \$56,000 gold, as against \$37,700.

Other importations were as follows :

	9 MOS., 1897.	9 MOS., 1896.
Cotton :		
Bales	9,936	23,127
Value.....	* \$411,973	* \$1,020,000
Crude petroleum imports :		
Gallons.....	6,260,164	5,486,667
Value.....	* \$277,300	* \$299,422
Refined petroleum :		
Gallons....	734,466	588,242
Value.....	\$136,180	\$122,447
Cotton seed oil :		
Gallons.....	1,010,580	912,905
Value.....	* \$199,000	* \$195,000

* Gold.

APPENDIX.

In the preceding paper I stated that I would give as an appendix some data concerning several subjects treated in the same, and I now append the documents mentioned ; the first one being a paper published in the *Bulletin of the American Geographical Society of New York* for March 31, 1894, under the title of "Mexico a Central American State," the second, some itineraries of the principal roads in Mexico, which show the broken surface of that country, and the third and last, a paper on the "Drainage of the Valley of Mexico," published by the *Engineering Magazine* of New York, Vol. viii., No. 4, for January, 1895.

MEXICO A CENTRAL AMERICAN STATE.

In the chapter of this paper entitled "Location, Boundaries, and Area," I referred, (page 9) to an article under the above heading, which I published in the *Bulletin of the American Geographical Society of New York* of March 31, 1894, and offered to give it in the appendix. That paper is the following :

MEXICO A CENTRAL AMERICAN STATE.¹

There is in this city a social gathering of ladies and gentlemen called "The Travellers' Club," meeting weekly during the winter of each year, for the purpose of studying a foreign country, on the supposition that its members are then travelling in that particular country, and with that view papers are read referring to the same, and they are illustrated with an exhibition of views and objects manufactured in the country under study, and of everything else that may contribute to impart more or less complete information regarding the place supposed to be visited.

During the winter of 1887-88 Mexico was chosen as the country under study by the club, and for that reason I received at the beginning of the year 1888 an invitation to attend some of its sessions, and to say something about the Republic. I accepted the invitation to attend some session, but stated to the invitation committee that, not having time to prepare a paper, I would only give some general notions on

¹ This article was published in the *Bulletin of the American Geographical Society of New York* of March 31, 1894, and it is inserted here without any changes. Although the data contained in this article was published in the years 1887 and 1893, as it refers to the area which has not changed, I have not thought it necessary to revise the same. So far as the Mexican States are concerned, I have later and more accurate data ; but the differences are insignificant, and it is not worth while to notice them. As regards the population, the increase has been proportionate ; in respect to all the countries mentioned in this article there is no marked change in the general proportions.

Mexico, in a conversational form, and would be glad to answer any question that might be put to me by those attending the meeting who felt the desire to have further information and more details.

Accordingly, the evening of the 16th of January, 1888, I attended the meeting of the club and spoke for about an hour on the geographical position of Mexico, its physical conditions, its natural resources, and other matters connected with the situation of the country, but carefully avoiding to touch any political question, especially of an international character.

With a view to leave a record of what I intended to say, I had with me a stenographer to take down what I would say, and although his notes were not complete, by using them, and those taken by reporters, some extracts of my conversation were prepared and published the next morning.

Speaking of the geographical position of Mexico, I naturally stated, what is a fact, although not generally realized, that while the main portion of the territory of Mexico is located in North America it occupies a considerable portion of Central America, although politically it is considered as wholly situated in North America. On this subject I made the following remarks, taken from the newspapers, but which were correct:

"The isthmus of Panama divides the New World into two continents, one situated on the northern and the other on the southern hemisphere, but as the position of that isthmus does not correspond with the line of the equator, and lies considerably north of that line, a large portion of South America proper lies in the boreal hemisphere. North America proper is divided by the isthmus of Tehautepec in two subdivisions—Central America from Panama to Tehautepec, and North America from Tehautepec to the North Pole.

"Central America in its present political organization includes the following States: Guatemala, Salvador, Honduras, Nicaragua, and Costa Rica, but from a geographical standpoint it has a much larger area, since it begins at the isthmus of Panama and ends at the isthmus of Tehuantepec. Taking this view, Mexico exercises sovereignty over a large portion of Central America, larger still than any single State of the five which are generally considered as the only components of the same, and representing a third of the total territorial area of Central America.

"The Mexican State of Chiapas and a part of Oaxaca, on the Pacific; of Yucatan, Campeche, and Tabasco, and a portion of the State of Vera Cruz on the Gulf of Mexico, are situated in geographical Central America.

"The following *résumé* of the territorial area and population of the several sections of Central America, taken from the *Statesman's Year Book*, London, 1887, shows that Mexico is a Central American as well as a North American power:

FIVE STATES OF CENTRAL AMERICA.

	Area in sq. miles.	Population.
Guatemala.....	46,800	1,224,602
Salvador.....	7,225	634,120
Honduras.....	46,400	458,000
Nicaragua.....	49,500	275,815
Costa Rica.....	23,200	213,785
Total.....	173,125	2,806,322

MEXICO.

State.	Area in sq. miles.	Population.
Chiapas.....	16,048	242,029
Oaxaca (one-fifth).....	6,718	152,255
Yucatan.....	29,567	302,319
Campeche.....	25,832	90,413
Tabasco.....	11,815	140,747
Vera Cruz (one-fourth).....	6,558	145,610
Total.....	<u>96,538</u>	<u>1,073,373</u>

This shows that 36 per cent. of the total area of Central America belongs to Mexico.

In the foregoing list I omitted to take into account that, besides the States referred to, there are in Central America proper the British Colony of Belize or British Honduras, and that part of the State of Panama, in Colombia, which lies north of the isthmus of Panama.

Taking the area and population of those places from the statistical and geographical data published by the *Almanach de Gotha* for 1893, and from some official information in possession of Señor Doctor Don Manuel M. de Peralta, Costa Rican Minister to Washington, a gentleman very well versed in Central American affairs, the following results are obtained :

	Area in square miles.	Area in square kilometers.	Population.
Chiapas.....	16,048	41,565	270,000
Oaxaca (one-fifth).....	6,718	17,400	158,800
Yucatan.....	29,567	76,579	330,000
Campeche.....	25,832	66,905	94,000
Tabasco.....	11,815	30,600	140,747
Veracruz (one-fourth)...	6,558	16,986	181,000
	<u>96,538</u>	<u>250,035</u>	<u>1,174,547</u>
Guatemala.....	48,300	125,100	1,520,000
Honduras.....	46,262	119,820	400,000
Salvador.....	8,135	21,070	800,000
Nicaragua.....	47,857	123,950	320,000
Costa Rica.....	24,000	62,000	270,000
Panama (two-thirds).....	19,278	50,000	200,000
British Honduras.....	8,300	21,475	31,500
	<u>202,132</u>	<u>523,415</u>	<u>3,541,500</u>

GEOGRAPHICAL EXTENSION OF CENTRAL AMERICA.

	Square miles.	Square kilometers.
Mexican Central America.....	96,538	250,035
Five Republics of Central America.....	174,554	451,940
British Honduras.....	8,300	21,475
Panama (two-thirds).....	19,278	50,000
	<u>298,670</u>	<u>773,450</u>

The foregoing table shows that a little more than 32 per cent. of the whole of Central America, geographically speaking, belongs to Mexico.

When those statements were translated into Spanish and published by *Las Novedades*, of New York, in its issue of the 18th of January, 1888, they were read by Señor Don Manuel Montufar, Secretary of the Guatemalan Legation in Washington, who, in the absence of the Minister, Señor Don Francisco Lainfiesta, was acting as *Chargé d'Affaires*, and he considered my statements in this connection as a geographical heresy, and as an evidence of the design of Mexico against the several States of Central America. His alarm was so great that he called the attention of the other representatives of the Central American States in Washington to this incident, in order to point out to them the serious dangers which he foresaw for their respective countries on account of my views, which he considered as more than extraordinary.

Fortunately, one of them, the representative of Costa Rica, Señor Doctor Don Manuel M. de Peralta, had attended the meeting of the Travellers' Club at which I spoke, and, I think, Doctor Don Horacio Guzman, the Nicaraguan Minister, was also present, although I am not sure of this, and both failed to see anything in what I stated in this connection that was not a geographical fact, and that, consequently, it could not be disputed; and therefore this incident, that threatened to assume certain proportions, died in its very cradle.

Señor Montufar showed himself over-sensitive at my remarks when there was not the slightest ground for such feeling. If I had made a geographical mistake in averring that a portion of the territory of Mexico was in Central America, geographically speaking, I would be the only sufferer by my mistake, because I would have been the laughing-stock of everybody, including the school-boy studying geography; and, on the contrary, if I had stated a fact, nobody had reason to complain, and much less to be alarmed.

My object in now mentioning this incident is to show the extreme sensitiveness of some Guatemalan gentlemen in regard to Mexico, which goes so far that they cannot listen sometimes to indisputable facts without umbrage, and without ascribing it to purposes and designs against their country. Fortunately this incident happened when the long-pending boundary dispute between Mexico and Guatemala had already been settled for several years, as, had it taken place before, when that question was opened, the situation would have been still more embarrassing and unpleasant.

M. ROMERO.

WASHINGTON, *December 29, 1893.*

MEXICAN PROFILES.

In the chapter on Orography of this paper (page 31) I stated that I would give some profiles of the Mexican surface, which would show in an exact manner the different altitudes from the sea-level to the high plateaus of the country. I have selected for that purpose the principal measurements by railroads built in Mexico, as they naturally followed the easiest ascent and descent, both from the coast to the interior and back to the coast. I will also supplement those measurements with others made for wagon roads to and from important places.

FROM VERACRUZ TO MEXICO BY ORIZABA,
BY THE MEXICAN RAILWAY.

STATIONS.	Distance between each station.		Distances.		Altitudes.	
	Kilom's.	Miles.	Kilom's.	Miles.	Metres.	Feet.
Veracruz.....	15.500	9.63	0.000	0.00	1.89	6.20
Tejeria.....	15.250	9.48	15.500	9.63	32.34	106.10
Purga.....	11.250	6.99	30.750	19.11	44.77	146.89
Soledad.....	21.250	13.21	42.000	26.10	93.08	305.39
Cameron.....	12.750	7.92	63.250	39.31	340.76	1116.47
Paso del Macho.....	10.000	6.22	76.000	47.23	475.55	1560.25
Atoyac.....	19.750	12.27	86.000	53.45	400.77	1314.91
Cordova.....	26.250	16.52	105.750	65.72	827.88	2713.61
Orizaba.....	20.250	12.58	132.000	82.04	1227.63	4027.80
Maltrata.....	20.250	12.59	152.250	94.62	1601.79	5255.40
Boca del Monte.....	6.500	4.04	172.500	107.21	2415.36	7924.66
Esperanza.....	24.250	15.07	179.000	111.25	2451.79	8044.20
San Andres.....	20.500	12.74	203.250	126.32	2430.42	7974.08
Rinconada.....	18.000	11.19	223.750	139.06	2357.32	7734.24
San Marcos.....	17.250	10.72	241.750	150.25	2373.21	7786.37
Huamantla.....	25.500	15.84	259.000	160.97	2488.06	8164.97
Apizaco.....	27.000	16.79	284.500	176.81	2411.51	7912.03
Soltepec.....	19.500	12.12	311.500	193.60	2507.62	8227.37
Apam.....	15.500	9.63	331.000	205.72	2486.92	8159.45
Irolo.....	22.000	13.67	346.500	215.35	2452.58	8046.78
Otumba.....	11.500	7.15	368.500	229.02	2349.41	7708.28
Teotihuacan.....	11.250	6.99	380.000	236.17	2281.57	7485.71
Tepexpam.....	32.500	20.20	380.000	236.17	2244.99	7365.69
Mexico.....	.....	.....	423.750	263.36	2239.83	7348.76

FROM APIZACO TO PUEBLA, A BRANCH OF
THE SAME ROAD.

Mexico.....	139.250	86.54	0.000	0.00	2239.83	7348.76
Apizaco.....	16.750	10.41	139.250	86.54	2411.51	7912.03
Santa Ana.....	18.250	11.29	156.000	96.95	2288.31	7507.82
Panzacola.....	12.000	7.52	174.250	108.24	2192.01	7191.86
Puebla.....	.....	.....	186.250	115.76	2154.63	7069.22

FROM VERACRUZ TO MEXICO BY JALAPA, BY THE INTEROCEANIC RAILWAY.

STATIONS.	Distance between each station.		Distances.		Altitudes.	
	Kilom's.	Miles.	Kilom's.	Miles.	Metres.	Feet.
Veracruz.....	20.234	12.58	0.000	0.00	2.00	6.56
Santa Fé.....	15.200	9.46	20.234	12.58	28.60	93.84
La Antigua.....	9.820	6.09	35.434	22.04	5.50	18.04
San Francisco.....	21.644	13.45	45.254	28.13	24.44	80.18
Rinconada.....	16.312	10.14	66.898	41.58	254.00	833.36
Colorado.....	9.781	6.07	83.210	51.72	520.70	1708.39
El Palmar.....	15.603	9.70	92.991	57.79	690.08	2264.12
Chavarrillo.....	14.675	9.12	108.594	67.49	941.24	3088.16
Pacho.....	8.558	5.32	123.269	76.61	1170.44	3840.15
Jalapa.....	10.510	6.53	131.827	81.93	1336.18	4383.94
Banderilla.....	14.227	8.84	142.337	88.46	1490.00	4888.62
San Miguel.....	14.870	9.25	156.564	97.30	1780.22	5840.82
Cruz Verde.....	16.569	10.29	171.434	106.55	2073.09	6801.70
Las Vigas.....	20.827	12.95	188.003	116.84	2421.10	7943.50
Perote.....	29.476	18.31	208.830	129.79	2390.30	7842.44
Tepeyahualco.....	17.041	10.59	238.297	148.10	2321.50	7615.23
Virreyes.....	17.064	10.61	255.338	158.69	2346.40	7698.41
Ojo de Agua.....	11.303	7.02	272.402	169.30	2348.33	7704.74
San Marcos.....	14.014	8.71	283.705	176.32	2412.60	7915.61
La Venta.....	10.357	6.44	297.719	185.03	2559.05	8396.10
Acajete.....	11.344	7.05	308.076	191.47	2469.25	8101.48
Amozoc.....	19.391	12.05	319.420	198.52	2312.04	7585.67
Puebla.....	7.919	4.92	338.811	210.57	2155.60	7072.39
Los Arcos.....	15.586	9.69	346.730	215.49	2130.96	6991.56
Analco.....	15.231	9.47	362.316	225.18	2197.50	7209.88
San Martin Texmelucan...	12.721	7.91	377.547	234.65	2258.61	7410.38
Atotonilco.....	24.259	15.05	390.268	242.56	2472.10	8110.83
Nanacamilpa.....	23.275	14.49	414.527	257.61	2740.16	8990.31
Calpulalpam.....	9.302	5.78	437.802	272.10	2576.10	8490.31
San Lorenzo.....	9.648	5.99	447.104	277.88	2484.22	8150.60
Irolo.....	15.617	9.71	456.752	283.87	2447.25	8029.30
Soapayuca.....	4.724	2.94	472.369	293.58	2409.05	7903.96
Otumba.....	31.209	19.39	477.093	296.52	2361.30	7747.29
Texcoco.....	11.452	7.92	508.302	315.91	2249.10	7379.13
San Vicente.....	9.353	5.19	519.754	323.03	2235.20	7333.52
Los Reyes.....	17.495	11.50	529.107	328.22	2240.10	7349.60
Mexico.....	.....	.....	546.602	339.72	2240.00	7349.27

FROM THE CITY OF MEXICO TO MORELOS, A BRANCH OF THE SAME ROAD.

Mexico.....	17.495	11.50	0.000	0.00	2240.00	7349.27
Los Reyes.....	7.005	3.73	17.495	11.50	2240.10	7349.60
Ayotla.....	9.300	5.77	24.500	15.23	2243.30	7360.09
La Compañia.....	12.900	8.02	33.800	21.00	2244.50	7364.03
Tenango.....	10.800	6.71	46.700	29.02	2324.20	7625.53
Amecameca.....	12.200	7.59	57.500	35.73	2466.50	8092.42
Otumba.....	22.900	14.23	69.700	43.32	2324.45	7626.33
Nepantla.....	26.800	16.66	92.600	57.55	1968.65	6459.04
Yecapixtla.....	16.500	10.25	119.400	74.21	1570.20	5151.75
Cuautla de Morelos.....	8.200	5.10	135.900	84.46	1216.48	3991.20
Calderon.....	14.000	8.70	144.100	89.56	1258.15	4127.92
Yautepec.....	18.000	11.19	158.100	98.26	1154.72	3788.59
Ticuman.....	8.200	5.09	176.100	109.45	968.22	3176.69
Tlaltizapan.....	8.700	5.41	184.300	114.54	934.10	3064.73
Tlalquitenango.....	2.300	1.43	193.000	119.95	900.80	2953.51
Jojutla.....	12.100	7.52	195.300	121.38	890.64	2922.15
San Jose.....	7.600	4.73	207.400	128.90	992.35	3255.84
Puente de Ixtla.....	.....	.....	215.000	133.63	896.99	2942.99

FROM PUEBLA TO IZÚCAR DE MATAMOROS, A BRANCH OF THE SAME
ROAD.

STATIONS.	Distance between each station.		Distances.		Altitudes.	
	Kilom's.	Miles.	Kilom's.	Miles.	Metres.	Feet.
Puebla.....	7.919	4.92	0.000	0.00	2155.60	7072.36
Los Arcos.....	5.000	3.11	7.919	4.92	2130.96	6991.52
Cholula.....	8.900	5.53	12.919	8.03	2145.00	7037.58
Santa María.....	18.100	11.25	21.819	13.56	2120.10	6955.89
San Augustin.....	5.850	3.64	39.919	24.81	2030.20	6660.94
Atlixco.....	19.150	11.90	45.769	28.45	1196.60	3925.99
San José Teruel.....	8.850	5.49	64.919	40.35	1685.18	5528.99
Tatetla.....	10.543	6.56	73.769	45.84	1584.94	5200.10
Matamoros.....	.....	.....	84.412	52.40	1443.80	4737.03

FROM MEXICO TO EL PASO DEL NORTE OR CIUDAD JUAREZ, BY THE
CENTRAL MEXICAN RAILROAD.

Mexico.....	11.700	7.27	0.000	0.00	2240.00	7349.32
Tlalnepantla.....	5.900	3.67	11.700	7.27	2250.10	7392.46
Barrientos.....	3.300	2.05	17.600	10.94	2298.50	7541.26
Lechería.....	6.800	4.23	20.900	12.99	2253.20	7392.63
Cuautitlan.....	8.300	5.15	27.700	17.22	2252.50	7390.33
Teoloyucan.....	10.500	6.52	36.000	22.37	2253.20	7392.63
Huehuetoca.....	6.000	3.74	46.500	28.89	2258.80	7411.00
Nochistongo.....	9.900	6.15	52.500	32.63	2248.00	7375.57
El Salto.....	17.600	10.96	62.400	38.78	2162.60	7095.37
Tula.....	13.500	8.39	80.000	49.72	2030.00	6660.32
San Antonio.....	24.300	15.10	93.500	58.11	2187.00	7175.43
Leña.....	3.800	2.37	117.800	73.21	2471.80	8109.84
Marquez.....	8.300	5.15	121.600	75.58	2426.50	7961.22
Nopala.....	8.000	5.04	129.900	80.73	2341.40	7682.00
Dañu.....	14.000	8.63	137.900	85.77	2387.70	7833.92
Polotitlan.....	9.200	5.72	151.900	94.40	2292.30	7520.91
Cazadero.....	10.900	6.77	161.100	100.12	2249.50	7380.49
Palmillas.....	18.600	11.57	172.000	106.89	2162.00	7093.40
San Juan del Rio.....	13.300	8.26	190.600	118.46	1905.50	6251.84
Chintepec.....	12.200	7.59	203.900	126.72	1894.90	6217.07
Ahorcado.....	24.400	15.16	216.100	134.31	1907.70	6259.07
Hércules.....	5.000	3.11	240.500	149.47	1843.90	6049.74
Querétaro.....	18.500	11.50	245.500	152.58	1813.20	5949.02
Mariscalá.....	14.500	9.01	264.000	164.08	1788.20	5867.00
Apaseo.....	13.000	8.08	278.500	173.09	1767.40	5798.75
Celaya.....	18.200	11.31	291.500	181.17	1757.40	5765.94
Guaje.....	22.800	14.17	309.700	192.48	1740.00	5708.85
Salamanca.....	11.100	6.90	332.500	206.65	1721.50	5648.15
Chico.....	9.200	5.72	343.600	213.55	1720.80	5645.85
Irapuato.....	16.600	10.31	352.800	219.27	1723.70	5655.37
Villalobos.....	13.200	8.20	369.400	229.58	1746.10	5728.87
Silao.....	19.000	11.82	382.600	237.78	1776.50	5828.61
Trinidad.....	14.200	8.82	401.600	249.60	1818.00	5964.77
Leon.....	16.400	10.19	415.800	258.42	1785.80	5859.12
Francisco.....	15.400	9.58	432.200	268.61	1765.00	5790.88
Pedrito.....	13.700	8.51	447.600	278.19	1795.00	5889.30
Loma.....	13.600	8.55	461.300	286.70	1890.40	6202.31
Lagos.....	10.600	6.59	474.900	295.15	1871.00	6138.66

FROM MEXICO TO EL PASO DEL NORTE OR CUIDAD JUAREZ, BY THE
CENTRAL MEXICAN RAILROAD.—*Continued.*

STATIONS.	Distance between each station.		Distances.		Altitudes.	
	Kilom's.	Miles.	Kilom's.	Miles.	Metres.	Feet.
Serrano (Altamira).....	10.300	6.77	485.500	301.74	2015.80	6613.68
Los Salas.....	24.700	15.35	495.800	308.14	2035.00	6676.68
Santa María.....	16.700	10.38	520.500	323.49	1844.50	6051.71
Encarnacion.....	26.400	16.41	537.200	333.87	1851.00	6073.04
Peñuelas.....	21.500	13.36	563.600	350.28	1878.60	6163.60
Aguascalientes.....	30.100	18.71	585.100	363.64	1884.00	6181.31
Pabellon.....	8.500	5.28	615.200	382.35	1908.50	6261.69
Rincon de Romos.....	20.500	12.74	623.700	387.63	1296.60	6321.08
Soledad.....	5.800	32.20	644.200	400.37	1979.00	6493.00
Guadalupe.....	9.900	6.15	696.000	432.57	2330.20	7645.22
Zacatecas.....	13.500	8.39	705.000	438.72	2442.00	8012.03
Pimienta.....	16.100	10.00	719.400	447.11	2306.50	7567.46
Calera.....	28.000	17.41	735.500	457.11	2152.60	7062.52
Fresnillo.....	15.500	9.63	763.500	474.52	2091.50	6862.06
Mendoza.....	15.000	9.32	779.000	484.15	2103.20	6900.44
Gutierrez.....	22.100	13.74	794.000	493.47	2087.10	6847.63
Cañitas.....	13.500	8.39	816.100	507.21	2006.60	6583.51
Cedro.....	20.700	12.86	829.600	515.60	1962.40	6438.53
La Colorada.....	25.800	16.04	850.300	528.46	1957.20	6421.48
Pacheco.....	19.000	11.81	876.100	544.50	1889.00	6197.72
Guzman.....	19.700	12.24	895.100	556.31	1810.60	5940.49
Gonzalez.....	21.400	13.30	914.800	568.55	1757.30	5765.60
Camacho.....	21.900	13.61	936.200	581.85	1664.60	5461.47
San Isidro.....	23.200	14.42	958.100	595.46	1582.30	5191.44
Symon.....	24.000	14.92	981.300	609.88	1568.90	5147.48
La Mancha.....	21.000	13.05	1005.300	624.80	1557.60	5110.41
Calvo.....	23.900	14.85	1026.300	637.85	1525.00	5003.44
Peralta.....	15.500	9.64	1050.200	652.70	1353.10	4439.45
Jimulco.....	14.400	8.95	1065.700	662.34	1267.20	4157.63
Jalisco.....	14.300	8.88	1080.100	671.29	1232.10	4042.46
Picardias.....	25.200	15.67	1094.400	680.17	1205.10	3953.87
Matamoros.....	16.400	10.01	1119.600	695.84	1145.30	3757.66
Toueon.....	5.200	3.16	1136.000	705.85	1140.30	3741.13
Lerdo.....	17.700	11.25	1141.200	709.01	1135.50	3725.51
Noé.....	20.000	12.43	1158.900	720.26	1116.90	3664.49
Mapimi.....	24.000	14.92	1178.900	732.69	1125.70	3693.36
Peronal.....	22.200	13.79	1202.900	747.61	1114.20	3657.63
Conejos.....	22.700	14.11	1225.100	761.40	1146.50	3761.61
Yermo.....	18.900	11.75	1247.800	775.51	1158.70	3801.64
Cevallos.....	18.500	11.55	1266.700	787.26	1188.50	3899.41
Zavalza.....	14.600	9.07	1285.200	798.76	1201.60	3942.39
Escalon.....	18.000	10.57	1299.800	805.83	1203.20	4144.50
Rellano.....	21.400	13.30	1317.800	819.02	1330.00	4363.66
Corralitos.....	19.400	12.06	1339.200	832.32	1442.70	4733.43
Dolores.....	14.700	9.13	1358.600	844.38	1379.90	4527.38
Jimenez.....	19.100	11.87	1373.300	853.51	1381.20	4531.65
La Reforma.....	18.800	11.69	1392.400	865.38	1347.60	4421.41
Diaz.....	19.200	11.93	1411.200	877.07	1298.90	4261.63
Bustamante.....	15.700	9.76	1430.400	889.00	1257.70	4126.46
Santa Rosalia.....	16.000	9.94	1446.100	898.76	1226.00	4022.45
La Cruz.....	20.400	12.68	1462.100	908.70	1216.60	3991.61
Concho.....	15.600	9.70	1482.500	921.38	1219.90	4002.43
Saucillo.....	16.100	10.00	1498.100	931.08	1210.20	3970.61
Las Delicias.....	7.300	4.54	1514.200	941.08	1170.30	3839.69
Ortiz.....	24.300	15.08	1521.500	945.62	1157.10	3796.39

FROM MEXICO TO EL PASO DEL NORTE OR CIUDAD JUAREZ, BY THE
CENTRAL MEXICAN RAILROAD.—*Continued.*

STATIONS.	Distance between each station.		Distances.		Altitudes.	
	Kilom's.	Miles.	Kilom's.	Miles.	Metres.	Feet.
Bachimba	17.400	10.76	1545.800	960.70	1264.10	4147.45
Horcasitas	22.400	13.91	1563.200	971.54	1366.50	4483.42
Mápula	22.900	14.24	1585.600	985.45	1514.40	4968.66
Chihuahua	23.100	14.36	1608.500	999.69	1412.30	4633.68
Sacramento	15.100	9.38	1631.600	1014.05	1519.90	4986.71
Ferragas	11.600	7.21	1646.700	1023.43	1591.50	5221.63
Sauz	19.900	12.37	1658.300	1030.64	1564.40	5132.71
Encinillas	13.900	8.64	1678.200	1043.01	1533.60	5031.66
Agua Nueva	13.400	8.33	1692.100	1051.65	1527.50	5011.65
Laguna	20.400	12.67	1705.500	1059.98	1535.70	5038.55
Puerto	20.200	12.56	1725.900	1072.65	1618.90	5311.53
Gallego	29.000	18.02	1746.100	1085.21	1622.00	5321.71
Chivatito	15.400	9.57	1775.100	1103.23	1480.50	4857.45
Moctezuma	13.100	8.14	1790.500	1112.80	1382.80	4536.89
Las Minas	13.500	8.33	1803.600	1120.94	1318.10	4324.62
Ojo Caliente	11.300	7.09	1817.100	1129.27	1233.30	4046.39
Cármén	22.800	14.17	1828.400	1136.36	1216.00	3989.64
San José	24.100	14.97	1851.200	1150.53	1194.60	3919.42
Ranchería	28.700	17.84	1875.300	1165.50	1281.80	4205.52
Los Médanos	18.200	11.32	1904.000	1183.34	1298.30	4259.66
Samalayuca	16.100	10.00	1922.200	1194.66	1274.50	4181.57
Tierra Blanca	14.400	8.95	1938.300	1204.66	1263.50	4145.48
Mesa	17.600	10.94	1952.700	1213.61	1207.10	3960.40
Ciudad Juárez			1970.300	1224.55	1133.10	3717.64

FROM AGUASCALIENTES TO TAMPICO, A BRANCH OF THE SAME ROAD.

Aguascalientes	14.300	8.90	0.000	0.00	1884.00	6181.31
Chicalote	6.200	3.84	14.300	8.90	1891.00	6204.28
Cañada	10.500	6.52	20.500	12.74	1921.50	6304.34
Gallardo	4.600	2.86	31.000	19.26	1955.75	6416.71
El Tule	15.200	9.45	35.600	22.12	1962.75	6439.68
San Gil	8.200	5.10	50.800	31.57	2011.50	6599.62
San Marcos	11.000	6.84	59.000	36.67	2031.25	6664.42
García	12.800	7.95	70.000	43.71	2117.40	6947.07
La Honda	11.000	6.84	82.800	51.46	2138.50	7016.30
Pefion Blanco	16.200	10.07	93.800	58.30	2100.75	6892.44
Salinas	13.600	8.44	110.000	68.37	2075.63	6810.91
Zotol	13.500	8.39	123.600	76.81	2120.50	6957.24
Espíritu Santo	25.400	15.79	137.100	85.20	2038.25	6687.39
Solana	62.200	38.65	162.500	100.99	2234.80	7332.25
San Luis Potosí	17.300	10.96	224.700	139.64	1877.00	6158.35
Laguna Seca	27.100	16.84	242.000	150.40	1827.00	5994.30
Corcovada	15.100	9.37	269.100	167.24	1700.00	5577.62
Peotillos	7.500	4.69	284.200	176.61	1740.00	5708.86
Silos	6.450	4.00	291.700	181.30	1509.00	4950.95
Puerto de San José	15.650	9.72	298.150	185.30	1566.00	5137.97
San Isidro	13.400	8.33	313.800	195.02	1257.00	4124.16
Cerritos	11.200	6.97	327.200	203.35	1136.00	3727.16
Santa Toribia (El Gato)	17.300	10.76	338.400	210.32	1100.00	3609.04
San Bartolo	43.300	26.90	355.700	221.08	1030.00	3379.38
Tanque de la Tinajilla	14.200	8.82	399.000	247.98	1190.00	3904.33
Cárdenas	14.700	9.14	413.200	256.80	1200.00	3937.14
La Labor	8.200	5.10	427.900	265.94	1200.00	3937.14

FROM AGUASCALIENTES TO TAMPICO, A BRANCH OF THE SAME ROAD.—
Continued.

STATIONS.	Distance between each station.		Distances.		Altitudes.	
	Kilom's.	Miles.	Kilom's.	Miles.	Metres.	Feet.
Las Canoas	7.900	4.91	436.100	271.04	990.00	3248.14
Los Llanos (Zacate).....	18.800	11.68	444.000	275.95	825.00	2706.78
Tamazopo (La Garita).....	16.800	10.44	462.800	287.63	350.00	1148.33
Rascon	15.100	9.38	479.600	298.07	295.00	967.88
Las Crucitas.....	9.500	5.91	494.700	307.45	275.00	902.26
El Salto (Micos).....	10.700	6.65	504.200	313.36	218.00	715.25
San Mateo.....	13.800	8.58	514.900	320.01	175.00	574.16
Valles.....	11.900	7.39	528.700	328.59	75.00	246.07
San Felipe.....	2.300	1.43	540.600	335.98	160.00	524.95
El Abra.....	4.000	2.49	542.900	337.41	165.00	541.35
Taninul.....	8.000	4.98	546.900	339.90	125.00	410.11
Las Palmas.....	68.700	42.68	554.900	344.88	50.00	164.05
Chijol	13.700	8.52	623.600	387.56	65.00	213.25
Salinas (Chila).....	17.900	11.13	637.300	396.08	5.00	16.40
Tamos.....	13.100	8.14	655.200	407.21	20.00	6.56
Tampico.....	.....	.....	668.300	415.35	0.00	0.00

FROM IRAPUATO TO GUADALAJARA, A BRANCH OF THE SAME ROAD.

Irapuato.....	5.100	3.17	0.000	0.00	1724.00	5656.36
San Miguel.....	11.300	7.02	5.100	3.17	1721.00	5646.52
Rivera.....	7.600	4.73	16.400	10.19	1712.00	5616.99
Cuitzeo.....	8.000	4.96	24.000	14.92	1700.00	5577.62
Abasolo (Rio Turbio).....	6.200	3.85	32.000	19.88	1695.00	5561.21
San Rafael.....	11.600	7.22	38.200	23.73	1690.00	5544.81
Pénjamo.....	14.300	8.89	49.800	30.95	1700.00	5577.62
Villaseñor.....	7.100	4.41	64.100	39.84	1690.00	5544.81
Palo Verde.....	13.500	8.40	71.200	44.25	1685.00	5528.40
Cortez.....	6.600	4.10	84.700	52.65	1675.00	5495.59
La Piedad.....	20.100	12.49	91.300	56.75	1675.00	5495.59
Patti.....	14.300	8.89	111.400	69.24	1665.00	5472.78
Yurecuaro.....	21.000	13.05	125.700	78.13	1540.00	5052.56
Negrete.....	6.400	3.97	146.700	91.18	1531.00	5023.13
La Barca.....	4.700	2.93	153.100	95.15	1537.00	5042.82
Feliciano.....	8.300	5.15	157.800	98.08	1540.00	5052.66
Limon.....	13.200	8.21	166.100	103.23	1543.00	5062.50
Ocotlan.....	17.500	10.88	179.300	111.44	1525.00	5003.44
Poncitlan.....	21.600	13.41	196.800	122.32	1522.00	4993.60
Atequiza.....	8.300	5.17	218.400	135.73	1512.00	4960.79
La Capilla.....	7.600	4.73	226.700	140.90	1515.00	4970.63
El Castillo.....	24.800	15.40	234.300	145.63	1525.00	5003.44
Guadalajara.....	.....	.....	259.100	161.03	1543.00	5062.50

FROM MEXICO TO LAREDO TAMAULIPAS, BY THE MEXICAN NATIONAL RAILWAY.

Mexico.....	4.600	2.86	0.000	0.00	2240.00	7349.32
Tacuba.....	4.800	2.98	4.600	2.86	2250.00	7382.13
Naucalpan.....	3.900	2.42	9.400	5.84	2280.00	7480.56
Rio Hondo.....	8.700	5.41	13.300	8.26	2300.00	7546.17
San Bartolito.....	5.500	3.42	22.000	13.67	2460.00	8071.13
Dos Rios.....	5.500	3.41	27.500	17.09	2680.00	8792.94
Laurel.....	5.900	3.68	33.000	20.50	2820.00	9252.27
Cumbre.....	2.500	1.55	38.900	24.18	3050.00	10006.89

FROM MEXICO TO LAREDO TAMAULIPAS.—*Continued.*

STATIONS.	Distance between each station.		Distances.		Altitudes.	
	Kilom's.	Miles.	Kilom's.	Miles.	Metres.	Feet.
Salazar.....	3.200	1.99	41.400	25.73	3000.00	9842.84
Carretera de Toluca.....	3.400	2.11	44.600	27.72	2900.00	9514.74
Fresno.....	2.500	1.56	48.000	29.83	2800.00	9186.75
Jajalpa.....	5.600	3.48	50.500	31.39	2720.00	8924.18
Ocoyoacac.....	3.000	1.86	56.100	34.87	2600.00	8530.46
Lerma.....	13.900	8.64	59.100	36.73	2540.00	8333.60
Toluca.....	7.400	4.60	73.000	45.37	2640.00	8661.70
Palmillas.....	16.700	10.38	80.400	49.97	2630.00	8628.89
Del Rio.....	14.700	9.14	97.100	60.35	2580.00	8464.84
Ixtlahuaca.....	12.300	7.64	111.800	69.49	2540.00	8333.60
Tepetitlan.....	9.800	6.09	124.100	77.13	2520.00	8267.98
Flor de María.....	20.200	12.56	133.900	83.22	2520.00	8267.98
Basoco.....	4.000	2.48	154.100	95.78	2580.00	8464.84
Venta del Aire.....	5.800	3.60	158.100	98.26	2560.00	8399.22
Tultenango.....	11.200	6.97	163.900	101.86	2540.00	8333.60
Solis.....	10.900	6.77	175.100	108.83	2430.00	7972.70
Tepetongo.....	7.100	4.41	186.000	115.60	2320.00	7611.79
Agua Buena (Buena Vista).....	7.800	4.85	193.100	120.01	2240.00	7349.32
Mayor.....	4.800	2.99	200.900	124.86	2160.00	7086.84
Pateo.....	3.400	2.10	225.700	127.85	2100.00	6889.98
Pomoca.....	14.100	8.76	209.100	129.95	2040.00	6693.13
Maravatio.....	12.000	7.47	223.200	138.71	2010.00	6594.70
San Antonio.....	8.700	5.40	235.200	146.18	2080.00	6824.37
Zirizicuaru.....	12.000	7.47	243.900	151.58	2010.00	6594.70
Tarandacuao.....	8.400	5.22	255.900	159.05	1920.00	6299.42
San José.....	8.500	5.28	264.300	164.27	1860.00	6102.57
Providencia.....	12.900	8.02	272.800	169.55	1880.00	6168.19
Acámbaro.....	12.500	7.76	285.700	177.57	1860.00	6102.57
San Cristobal.....	17.500	10.88	298.200	185.33	1840.00	6036.95
Salvatierra.....	15.500	9.63	315.700	196.21	1760.00	5774.48
Cascalote.....	8.900	5.53	331.200	205.84	1760.00	5774.48
Ojo Seno.....	14.200	8.84	340.100	211.37	1770.00	5807.29
Celaya.....	5.200	3.22	354.300	220.21	1740.00	5708.86
Santa Rita.....	7.400	4.60	359.500	223.43	1760.00	5774.48
San Juan.....	3.800	2.37	366.900	228.03	1780.00	5840.10
Soria.....	7.200	4.47	370.700	230.40	1785.00	5856.50
Chamacuero.....	8.900	5.57	377.900	234.87	1790.00	5872.91
Rinconcillo.....	13.000	8.08	386.800	240.40	1810.00	5938.52
Begoña.....	9.100	5.65	399.800	248.48	1825.00	5987.73
San Miguel de Allende.....	11.600	7.21	408.900	254.13	1870.00	6135.38
Atotonilco.....	11.300	7.03	420.500	261.34	1860.00	6102.57
Tequizquiapan.....	12.800	7.95	431.800	268.37	1870.00	6135.38
Dolores Hidalgo.....	7.200	4.48	444.600	276.32	1890.00	6201.00
Rincon.....	11.300	7.02	451.800	280.80	1900.00	6233.88
Peña Prieta.....	9.100	5.65	463.100	287.82	1930.00	6332.23
Trancas.....	9.000	5.59	472.200	293.47	1950.00	6397.85
Obregon.....	18.700	11.63	481.200	299.06	1990.00	6529.09
Ciudad Gonzalez (San Felipe).....	14.400	8.95	499.900	310.69	2050.00	6725.94
Chirimoya.....	13.200	8.20	514.300	319.64	1860.00	6102.57
Jaral.....	16.700	10.38	527.500	327.84	1840.00	6036.95
Villa de Reyes.....	10.000	6.22	544.200	338.22	1830.00	6004.14
Jesus Maria.....	14.800	9.19	554.200	344.44	1810.00	5938.52
La Pila.....	15.000	9.33	569.000	353.63	1900.00	6233.88
San Luis Potosí.....	13.400	8.33	584.000	362.96	1860.00	6102.57
Peñasco.....	15.100	9.37	597.400	371.29	1840.00	6036.95
Pinto.....	12.500	7.78	612.500	380.66	1820.00	5971.33
Bocas.....	13.600	8.45	625.000	388.44	1700.00	5577.62
Enramada.....	15.200	9.45	638.600	396.89	1680.00	5512.00
Moctezuma.....	18.900	11.75	653.800	406.34	1660.00	5446.38

FROM MEXICO TO LAREDO TAMAULIPAS.—*Continúa.*

STATIONS.	Distance between each station.		Distances.		Altitudes.	
	Kilom's.	Miles.	Kilom's.	Miles.	Metres.	Feet.
El Venado	17.000	10.56	672.600	418.09	1740.00	5708.86
Los Charcos	16.300	10.13	689.700	428.65	1880.00	6168.19
Laguna Seca	11.600	7.20	706.600	438.78	2020.00	6627.51
Berrendo	15.400	9.58	717.600	445.98	1990.00	6529.09
La Maroma	16.000	9.94	733.000	455.56	1880.00	6168.19
Wadley	8.600	5.35	749.000	465.50	1840.00	6036.95
Catorce	6.800	4.23	757.600	470.85	1820.00	5971.33
Poblazon	15.200	9.44	764.400	475.08	1780.00	5840.10
Vanegas	16.400	10.20	779.600	484.52	1720.00	5643.24
La Trueba (La Parida)	15.800	9.81	796.000	494.72	1720.00	5643.24
San Vicente	15.700	9.76	811.800	504.53	1700.00	5577.62
El Salado	15.700	9.75	827.500	514.29	1720.00	5643.24
Lulu	20.200	12.56	843.200	524.04	1720.00	5643.24
La Ventura	20.000	12.43	863.400	536.60	1720.00	5643.24
Santa Elena	20.900	13.00	883.400	549.03	1760.00	5774.48
Gomes Farias	13.200	8.20	904.300	562.03	1940.00	6365.04
El Oro	17.300	10.77	917.500	570.23	1980.00	6496.28
Carneros	9.600	5.94	934.800	580.99	2080.00	6824.37
Agua Nueva	13.200	8.21	944.400	586.93	1920.00	6299.42
Encantada	6.300	3.92	957.600	595.14	1840.00	6036.95
Buena Vista	9.700	6.03	963.900	599.06	1750.00	5741.67
Saltillo	1.500	7.15	973.600	605.09	1600.00	5249.52
Los Bosques	3.500	2.17	985.100	612.24	1430.00	4691.76
Ramos Arizpe	7.300	4.55	988.600	614.41	1400.00	4593.33
Santa Maria	9.700	6.02	995.900	618.96	1320.00	4330.85
Ojo Caliente	7.000	4.35	1005.600	624.98	1220.00	4002.76
Los Muertos	2.300	1.40	1012.600	629.33	1160.00	3805.90
La Mariposa	10.400	6.46	1014.900	630.77	1120.00	3674.66
Rinconada	7.700	4.78	1025.300	637.23	1000.00	3280.95
Los Fierros	5.500	3.42	1033.000	642.01	930.00	3051.28
Soledad	10.200	6.34	1038.500	645.43	820.00	2693.38
Garcia	21.100	13.11	1048.700	651.77	740.00	2427.91
Santa Catarina	2.800	1.74	1069.800	664.88	640.00	2099.81
Leona	4.700	2.87	1072.600	666.62	600.00	1968.57
San Gerónimo	2.900	1.79	1077.300	669.55	590.00	1935.76
Gonzalitos	2.500	1.56	1080.200	671.34	580.00	1902.95
Monterey	7.600	4.73	1082.700	672.90	560.00	1837.33
Ramon Treviño	6.100	3.79	1090.300	677.63	510.00	1673.28
Topo	20.900	12.99	1096.400	681.42	480.00	1574.86
Salinas	8.100	5.03	1117.300	694.41	430.00	1410.81
Morales	16.300	10.13	1125.400	699.44	460.00	1509.24
Stevenson (Palmito)	8.700	5.40	1141.700	709.57	580.00	1902.95
Palo Blanco	13.200	8.20	1150.400	714.97	560.00	1837.33
Álamo	12.600	7.84	1163.600	723.17	490.00	1607.67
Villa Aldama	2.100	1.31	1176.200	731.01	420.00	1378.00
Guadalupe	3.400	2.11	1178.300	732.32	420.00	1378.00
Bustamante	9.800	6.09	1181.700	734.43	440.00	1443.62
Huizache	1.400	7.08	1191.500	740.52	470.00	1542.05
Golondrinas	12.000	7.46	1202.900	747.60	410.00	1345.19
Salome, Botello	12.100	7.52	1214.900	755.06	380.00	1246.76
Brasil	8.900	5.53	1227.000	762.58	340.00	1115.52
Lampazos	23.300	14.48	1235.900	768.11	300.09	984.28
Mojina	21.200	13.18	1259.200	782.59	240.00	787.43
Rodriguez	12.400	7.71	1280.400	795.77	200.00	656.19
Camarón	11.500	7.15	1292.800	803.48	200.00	656.19
Huizachito	16.500	10.25	1304.300	810.63	210.00	689.00
Jarita	13.100	8.14	1320.800	820.88	200.00	656.19
Sanchez	16.100	10.01	1333.900	829.02	160.00	524.95
Laredo de Tamaulipas			1350.000	839.03	130.00	426.52

Itineraries.

261

FROM ACÁMBARO TO PÁTZCUARO, A BRANCH OF THE SAME ROAD.

STATIONS.	Distance between each station.		Distances.		Altitudes.	
	Kilom's.	Miles.	Kilom's.	Miles.	Metres.	Feet.
Acámbaro.....	13.250	8.23	0.000	0.00	1840.00	6036.95
La Cumbre.....	17.610	10.96	13.250	8.23	1960.00	6430.66
Andocutin.....	6.170	3.83	30.860	19.19	1840.00	6036.95
Huingo.....	12.360	7.68	37.030	23.02	1840.00	6036.95
Querendaro.....	4.000	2.49	49.390	30.70	1840.00	6036.95
Zinzimeo.....	10.000	6.22	53.390	33.19	1840.00	6036.95
Quirio.....	7.610	4.73	63.390	39.41	1860.00	6102.57
Charo.....	5.920	3.67	71.000	44.14	1870.00	6135.38
La Goleta.....	3.150	1.95	76.920	47.81	1870.00	6135.38
Atapaneo.....	11.200	6.96	80.070	49.76	1880.00	6168.19
Morelia.....	19.900	12.37	91.270	56.72	1890.00	6201.00
Jacuaro.....	9.610	5.98	111.170	69.09	2000.00	6561.89
Coapa.....	6.800	4.22	120.780	75.07	2060.00	6758.75
Lagunillas.....	10.380	6.46	127.580	79.29	2100.00	6889.98
Ponce.....	2.910	1.80	137.960	85.75	2120.00	6955.60
Chapultepec.....	12.530	7.79	140.870	87.55	2100.00	6889.98
Pátzcuaro.....			153.400	95.34	2040.00	6693.13

FROM PIEDRAS NEGRAS OR CIUDAD PORFIRIO DIAZ TO DURANGO, BY THE MEXICAN INTERNATIONAL RAILWAY.

Ciudad Porfirio Diaz.....	6.540	4.06	0.000	0.00	220.00	721.81
Fuente.....	7.060	4.39	6.540	4.06	232.00	761.17
Rosa.....	26.200	16.29	13.600	8.45	278.00	912.11
Nava.....	11.960	7.44	39.800	24.74	324.00	1063.02
Allende.....	14.940	9.28	51.760	32.18	375.00	1230.35
Leona.....	15.640	9.71	66.700	41.46	455.00	1492.83
Peyotes.....	21.430	13.32	82.340	51.17	486.00	1594.55
Blanco.....	12.850	7.99	103.770	64.49	387.00	1269.73
Sabinas.....	15.850	9.85	116.620	72.48	340.00	1115.52
Soledad.....	10.650	6.61	132.470	82.33	371.00	1217.23
Baroterán.....	14.120	8.78	143.120	88.94	425.00	1394.40
Aura.....	15.090	9.39	157.240	97.72	453.00	1486.27
Obayos.....	15.330	9.52	172.330	107.11	396.00	1299.26
Baluarte.....	10.690	6.65	187.660	116.63	373.00	1223.79
Hermanas.....	21.230	13.18	198.350	123.28	396.00	1299.26
Adjuntas.....	13.570	8.44	219.580	136.46	465.00	1525.64
Estancia.....	4.770	2.97	233.150	144.90	547.00	1794.68
Monclova.....	18.560	11.54	237.920	147.87	587.00	1925.92
Castafio.....	14.920	9.29	256.480	159.41	748.00	2454.16
Gloria.....	19.590	12.16	271.400	168.70	823.00	2700.22
Bajan.....	12.420	7.71	290.990	180.86	843.00	2765.84
Joya.....	20.410	12.68	303.410	188.57	824.00	2719.91
Espinazo.....	12.080	7.52	323.820	201.25	817.00	2680.54
Reata.....	22.860	14.21	335.900	208.77	900.00	2952.85
Treviño (Venadito).....	26.040	16.16	358.760	222.98	890.00	2920.05
Sauceda.....	24.760	15.40	384.800	239.14	997.00	3271.11
Jaral.....	23.020	14.31	409.560	254.54	1144.00	3753.40
Pastora.....	21.610	13.44	432.580	268.85	1157.00	3796.06
Cármen.....	23.970	14.89	454.190	282.29	1182.00	3878.08
Paila.....	19.670	12.23	478.160	297.18	1188.00	3897.77
Mimbre.....	16.540	10.28	497.830	309.41	1132.00	3714.03
Rafael.....	12.970	8.05	514.370	319.69	1102.00	3615.60
Pozo.....	11.290	7.02	527.340	327.74	1105.00	3625.44

FROM PIEDRAS NEGRAS OR CIUDAD PORFIRIO DIAZ TO DURANGO, BY
THE MEXICAN INTERNATIONAL RAILWAY.—Continued.

STATIONS.	Distance between each station.		Distances.		Altitudes.	
	Kilom's.	Miles.	Kilom's.	Miles.	Metres.	Feet.
Bola.....	13.480	8.38	538.630	334.76	1089.00	3572.96
Mayran.....	10.870	6.75	552.110	343.14	1094.00	3589.36
Hornos.....	13.410	8.35	562.980	349.89	1096.00	3595.93
Colonia.....	17.620	10.95	576.390	358.24	1105.00	3625.44
Matamoros.....	22.540	14.00	594.010	369.19	1112.00	3648.41
Torreón.....	8.050	5.00	616.550	383.19	1134.00	3720.59
San Carlos.....	15.740	9.18	624.600	388.19	1137.71	3732.77
Loma.....	19.280	11.98	640.340	397.97	1181.52	3876.51
Chocolate.....	20.870	12.98	659.620	409.95	1377.25	4518.69
Huárichic.....	15.200	9.45	680.490	422.93	1325.37	4348.45
Pedriceña.....	25.640	15.93	695.690	432.38	1318.85	4327.07
Pasaje.....	24.540	15.25	721.330	448.31	1605.28	5266.84
Yerbanis.....	21.580	13.41	745.870	463.56	1608.73	5262.53
Noria.....	12.760	7.93	767.450	476.97	1895.00	6217.40
Catalina.....	12.150	7.56	780.210	484.90	1969.47	6461.73
Tapona.....	22.040	13.70	792.360	492.46	1982.72	6505.21
Gabriel.....	16.930	10.52	814.400	506.16	1955.20	6414.91
Chorro.....	26.420	16.42	831.330	516.68	1868.10	6129.15
Labar.....	11.760	7.30	857.750	533.10	1864.38	6116.93
Durango.....	.....	.....	869.510	540.40	1880.13	6168.62

FROM SABINAS TO HONDO, A BRANCH OF THE SAME ROAD.

Sabinas.....	17.530	10.83	0.000	0.00	340.00	1115.52
San Felipe.....	2.380	1.48	17.430	10.83	313.00	1026.93
Hondo.....	.....	.....	19.810	12.31	319.00	1046.62

FROM THE CITY OF MEXICO TO CUERNAVACA AND ACAPULCO.
LINE FINISHED.

Mexico.....	28.060	17.44	0.000	0.00	2240.00	7349.27
Contreras.....	17.883	11.11	28.060	17.44	2480.00	8091.75
Ajusco.....	15.191	9.44	45.943	28.55	2840.00	9272.89
La Cima.....	12.966	8.07	61.134	37.99	3040.00	9974.08
Xacapexco (Tres Marias)...	18.400	11.43	74.100	46.06	2800.00	9186.75

LINE IN CONSTRUCTION.

San Juanico.....	31.250	19.42	92.500	57.49	2290.00	7513.37
Cuernavaca.....	7.250	4.51	123.750	76.91	1520.00	4987.04
Jiutepec.....	6.750	4.20	131.000	82.42	1300.00	4265.23
San Vicente.....	21.000	13.05	137.750	85.62	1260.00	4134.00
Xoxocotla.....	14.050	8.73	158.750	98.67	1030.00	3379.38
Puente de Ixtla.....	8.950	5.56	172.800	107.40	900.00	2952.85
Río Amacuzac.....	23.250	14.45	181.750	112.96	890.00	2920.05
Buena Vista.....	21.000	13.05	205.000	127.41	1200.00	3937.14
Iguala.....	11.000	6.84	226.000	140.46	720.00	2362.29
Tepecoacuilco.....	34.750	21.13	237.000	147.30	800.00	2624.76
Xalitla.....	12.050	7.91	271.750	168.47	620.00	2034.19
Mexcala.....	28.700	17.84	283.800	176.38	480.00	1574.86
Venta del Zopilote.....	11.500	7.15	312.500	194.22	760.00	2493.53
Zumpango.....	13.000	8.08	324.000	201.37	1000.00	3280.95

FROM THE CITY OF MEXICO TO CUERNAVACA AND ACAPULCO. LINE IN CONSTRUCTION. (Continued.)

STATIONS.	Distance between each station.		Distances.		Altitudes.	
	Kilom's.	Miles.	Kilom's.	Miles.	Metre	Feet.
Tierras Prietas.....	4.800	2.98	337.000	209.45	1320.00	4330.85
Chilpancingo.....	15.200	9.45	341.800	212.43	1200.00	3937.14
Cima de Valadez.....	8.250	5.12	357.000	221.88	1300.00	4265.23
La Imagen.....	11.750	7.31	365.250	227.00	1060.00	3477.81
Los Cajones.....	6.000	3.72	377.000	234.31	1000.00	3280.95
El Rincon.....	12.000	7.46	383.000	238.03	670.00	2198.24
Dos Caminos.....	12.000	7.46	395.000	245.49	600.00	1968.57
Tierra Colorada.....	9.000	5.60	407.000	252.95	300.00	984.28
Rio Omítlan.....	4.000	2.48	416.000	258.55	180.00	590.57
Peregrino.....	32.000	19.89	420.000	261.03	140.00	459.33
Cacahuatpec.....	24.500	15.23	452.000	280.92	60.00	196.86
Marquez.....	16.500	10.25	476.500	296.15	20.00	65.62
Acapulco.....			493.000	306.40	0.00	0.00

FROM PUEBLA TO OAXACA, BY THE MEXICAN SOUTHERN RAILWAY.

Puebla.....	18.400	11.43	0.000	0.00	2157.00	7077.00
Amozoc.....	7.600	4.73	18.400	11.43	2312.00	7585.54
Santa Rosa.....	11.200	6.95	26.000	16.16	2295.00	7529.77
Tepeaca.....	17.400	10.82	37.200	23.11	2244.60	7364.41
Rosendo Márquez.....	10.500	6.53	54.600	33.93	2055.00	6742.34
Tecamachalco.....	12.600	7.83	65.100	40.46	2014.10	6608.15
Las Animas.....	9.400	5.84	77.700	48.29	2000.00	6561.89
Tlacotepec.....	31.300	19.46	87.100	54.13	1988.25	6523.35
Carnero.....	8.900	5.53	118.400	73.59	1752.37	5749.43
Tehuacan.....	14.700	9.13	127.300	79.12	1662.57	5454.81
La Huerta.....	6.300	3.92	142.000	88.25	1453.29	4768.18
Santa Cruz.....	10.900	6.76	148.300	92.17	1370.31	4495.91
Pantzingo.....	14.600	9.09	159.200	98.93	1246.00	4088.07
Nopala.....	6.400	3.97	173.800	108.02	1060.56	3479.65
Venta Salada.....	15.200	9.46	180.200	111.99	972.07	3189.31
San Antonio.....	8.700	5.40	195.400	121.45	787.92	2585.13
Mexia.....	20.300	12.62	204.100	126.85	695.00	2280.26
Tecomavaca.....	10.900	6.78	224.400	139.47	559.71	1836.38
Quiotepec.....	17.000	10.56	235.300	146.25	540.00	1771.71
Cuicatlan.....	4.800	2.98	252.300	156.81	592.00	1942.32
Tomellin.....	19.200	11.93	257.100	159.79	672.00	2204.80
Almoloyas.....	16.500	10.26	276.300	171.72	1055.00	3461.40
Santa Catarina.....	16.200	10.06	292.800	181.98	1332.00	4370.22
El Parian.....	13.700	8.52	309.000	192.04	1495.00	4905.02
Las Sedas.....	12.800	7.96	322.700	200.56	1927.00	6322.39
San Pablo Huitzo.....	13.100	8.13	335.500	208.52	1695.00	5561.21
Villa de Etla.....	18.000	11.19	348.600	216.65	1642.00	5387.32
Oaxaca.....			366.600	227.84	1545.00	5069.06

FROM COATZACOALCOS TO SALINA CRUZ, BY THE NATIONAL TEHUANTEPEC RAILWAY.

Coatzacoalcos.....	21.749	13.51	0.000	0.00	2.00	6.56
Los Limones.....	15.140	9.42	21.749	13.51	16.00	52.50
Chinameca.....	5.407	3.35	36.889	22.93	6.00	19.69
Jaltipan.....	20.547	12.77	42.296	26.28	40.00	131.24
Ojapa.....	12.568	7.83	62.843	39.05	32.00	104.99
Almagres.....	11.589	7.19	75.411	46.88	48.00	157.49

STATIONS.	Distance between each station.		Distances.		Altitudes.	
	Kilom's.	Miles.	Kilom's.	Miles.	Metres.	Feet.
Juile.....	9.284	5.77	87.000	54.07	40.00	131.24
Medias Aguas.....	9.672	6.01	96.284	59.84	32.00	104.99
Tortugas.....	21.044	13.08	105.956	65.85	44.00	144.36
Santa Lucrecia.....	7.000	4.36	127.000	78.93	30.00	98.43
Los Muertos.....	10.000	6.21	134.000	83.29	35.00	114.83
Ubero.....	14.801	9.20	144.000	89.50	25.00	82.02
Tolosa.....	7.199	4.47	158.801	98.70	52.00	170.61
Palomares.....	20.570	12.78	166.000	103.17	88.00	288.73
Mogofé.....	15.176	9.43	186.570	115.95	92.00	301.85
Rincon Antonio.....	13.254	8.25	201.746	125.38	176.00	577.45
Lagunas.....	17.764	11.04	215.000	133.63	260.00	853.05
Chivela.....	10.236	6.35	232.764	144.67	244.00	800.55
Rio Verde.....	17.186	10.68	243.000	151.02	115.00	377.30
San Gerónimo.....	28.218	17.54	260.186	161.70	56.00	183.74
Tehuantepec.....	3.596	2.24	288.404	179.24	36.00	108.12
Santa Cruz.....	17.617	10.94	292.000	181.48	36.00	108.12
Salina Cruz.....	.....	.....	309.617	192.42	2.00	6.56

FROM THE CITY OF MEXICO TO PACHUCA, BY THE HIDALGO AND
NORTHEASTERN MEXICAN RAILWAY.

LINE FINISHED.

NORTHEASTERN RAILWAY FROM MEXICO TO TIZAYUCA.

Mexico.....	19.000	11.80	0.000	0.00	2264.76	7430.56
Canal.....	11.400	7.10	19.000	11.80	2266.01	7434.66
Ojo de Agua.....	5.200	3.23	30.400	18.90	2272.96	7457.46
Santa Ana.....	14.800	9.20	35.600	22.13	2271.36	7452.21
Tizayuca.....	.....	.....	50.400	31.33	2294.65	7528.62

HIDALGO RAILWAY TO TUXPAN.

Tizayuca.....	16.100	10.00	.....	.....	.....	.....
Tezontepec.....	10.800	6.52	66.500	41.33	2344.87	7693.38
San Augustin.....	6.000	3.92	77.300	47.85	2390.00	7841.46
Tepa.....	8.400	5.23	83.300	51.77	2438.08	7999.21
Tecajete.....	11.900	7.38	91.700	57.00	2538.00	8327.04
Somo Riel.....	10.600	6.60	103.600	64.38	2638.50	8656.78
Las Lajas.....	7.000	4.34	114.200	70.98	2504.80	8218.10
Los Romeros.....	11.700	7.28	121.200	75.32	2392.80	7850.64
Santiago.....	5.700	3.54	132.900	82.60	2221.72	7289.33
Tulancingo.....	7.200	4.48	138.600	86.14	2187.29	7176.39
Sototlan.....	.....	.....	145.800	90.62	2171.46	7124.44

FROM TEPA TO PACHUCA, A BRANCH OF THE HIDALGO RAILROAD.

Tepa.....	8.700	5.41	0.000	0.00	2438.08	7999.21
Xochihuacan.....	17.300	10.75	8.700	5.41	2380.06	7808.85
Pachuca.....	.....	.....	26.000	16.16	2420.99	7493.15

FROM SAN AGUSTIN TO IROLO, A BRANCH OF THE HIDALGO RAILWAY.

San Agustin.....	14.600	9.08	0.000	0.00	2390.00	7841.46
Tlanalapa.....	13.700	8.51	14.600	9.08	2437.39	7996.95
Irolo.....	.....	.....	28.300	17.59	2452.58	8046.78

FROM DURANGO TO MAZATLAN BY BRIDLE-PATH.

PLACES.	Altitudes.		PLACES.	Altitudes.	
	Metres.	Feet.		Metres.	Feet.
Durango.....	1880.13	6168.62	La Ramona.....	1220.00	4002.76
Salitre.....	1925.00	6315.82	El Chapote.....	950.00	3116.90
El Salto.....	1900.00	6233.80	Rio del Baluarte.....	630.00	2067.00
Arroyo Seco.....	1890.00	6201.00	La Ventanita.....	770.00	2526.34
Camino del Jaral.....	1890.00	6201.00	Sotolito.....	1550.00	5085.47
El Escalon.....	1980.00	6496.28	El Carrizo de Adentro.....	1825.00	5987.73
Las Indias.....	2120.00	6955.60	El Carrizo de Afuera.....	1860.00	6102.57
Calzon Roto.....	2180.00	7152.46	Las Loberas.....	1970.00	6463.47
El Pino.....	2260.00	7414.94	El Venteadero.....	1930.00	6332.23
Rio Chico.....	2020.00	6627.51	Puerta de los Pilares.....	1250.00	4101.19
La Palmita.....	2220.00	7283.70	Arroyo del Leon.....	1120.00	3674.66
Los Cerritos.....	2260.00	7414.94	Palotillo.....	1010.00	3313.76
Los Mimbres.....	2180.00	7152.46	Platanito.....	940.00	3084.09
Buena Vista.....	2330.00	7644.60	Santa Catarina.....	210.00	689.00
Los Charcos.....	2340.00	7674.41	El Limon.....	130.00	426.52
Los Navios.....	2350.00	7710.22	El Tecomate.....	110.00	360.90
Navajas.....	2260.00	7414.94	Tagarete.....	85.00	278.88
Llano Grande.....	2160.00	7086.84	Rio del Presidio.....	55.00	180.45
Cruz de Piedra.....	2230.00	7316.51	Porras.....	65.00	213.26
Coyotes.....	2270.00	7447.75	Sigueros.....	50.00	164.05
El Salto.....	2280.00	7480.56	La Cofradia.....	45.00	147.64
Piloncillos.....	2390.00	7841.46	Confite.....	62.00	203.42
La Florida.....	2440.00	8005.51	La Escondida.....	68.00	223.11
Junta de los Caminos.....	2390.00	7841.46	Las Higueras.....	30.00	98.43
El Tecomate.....	2100.00	6889.98	Las Conchas.....	22.30	73.16
Chavarria.....	1710.00	5610.43	Carboneras.....	15.50	50.85
La Cienega.....	2160.00	7086.84	Palos Prietos.....	1.54	5.05
Las Botijas.....	2050.00	6725.94	Mazatlan.....	0.00	0.00
La Escondida.....	2035.00	6676.72			

FROM MANZANILLO TO GUADALAJARA BY WAGON ROAD.

Manzanillo.....	0.00	0.00	Ciudad Guzman (Zapotlan).....	1412.00	4632.70
Cerro del Vigia.....	125.00	410.11	Santa Catarina.....	1412.00	4632.70
Cola de Iguana.....	50.00	164.05	La Cuesta.....	1450.00	4767.38
El Ciruelo.....	75.00	246.07	San Nicolás.....	1300.00	4265.23
Canoa Verde.....	75.00	346.07	Amatitlan.....	1325.00	4347.25
Las Trojes.....	100.00	328.09	Sayula.....	1350.00	4429.28
Valenzuela.....	125.00	410.11	Ojo de Agua.....	1360.00	4462.09
Tecolapa.....	175.00	574.16	Cofradia.....	1375.00	4511.30
La Noria.....	312.00	1023.65	Techolula.....	1375.00	4511.30
La Presa.....	362.00	1187.70	Cuevitas.....	1360.00	4462.09
Colima.....	560.00	1837.33	El Cuemasate.....	1325.00	4347.25
La Puerta.....	650.00	2132.62	El Crucero.....	1325.00	4347.25
San Joaquin.....	650.00	2132.62	Cebollas.....	1350.00	4429.28
Los Limones.....	850.00	2788.81	Los Pozos.....	1325.00	4347.25
San Gerónimo.....	900.00	2952.85	Chimaltitlan.....	1325.00	4347.25
Los Alcaracos.....	1100.00	3609.04	Ocotan.....	1330.00	4363.66
La Queseria.....	1162.00	3812.46	Santa Ana Acatlan.....	1350.00	4429.28
Tonila.....	1175.00	3854.61	Puerta.....	1500.00	4921.42
Barranca Cachepehuate	975.00	3198.92	Cofradia.....	1512.00	4960.79
San Marcos.....	985.00	3231.73	Santa Cruz.....	1475.00	4987.05
Barranca de Beltran...	850.00	2788.81	Arenal.....	1600.00	5249.52
Playa.....	1025.00	3362.97	San Agustin.....	1575.00	5167.49
Barranca Platanar...	950.00	3116.90	La Calera.....	1575.00	5167.49
Loma.....	1225.00	4019.16	Puente de Santa Maria.	1550.00	5085.47
Barranca de Atenquique	1025.00	3362.97	Guadalajara.....	1500.00	4921.42
Ocote Gacho.....	1250.00	4101.19			
Pedregal.....	1375.00	4511.30			

FROM TEHUACAN TO OAXACA AND PUERTO ANGEL BY WAGON ROAD.

PLACES.	Altitudes.		PLACES.	Altitudes.	
	Metres.	Feet.		Metres.	Feet.
Tehuacan.....	1660.00	5446.38	Tierra Blanca.....	2000.00	6561.89
La Huerta.....	1480.00	4855.81	Rio Atoyac.....	1660.00	5446.38
Arroyo de Buena Vista.	1320.00	4330.85	San Pablo Huitzo....	1700.00	5577.62
San Sebastian.....	1120.00	3674.66	Santiago Huitzo.....	1680.00	5512.00
Camino de Calipán....	1060.00	3477.81	Villa de Etla.....	1660.00	5446.38
Calaveras.....	960.00	3149.71	Dolores.....	1640.00	5380.76
San Antonio.....	900.00	2952.85	Panzacola.....	1540.00	5052.66
Hacienda de Ayotla..	860.00	2821.62	Oaxaca.....	1540.00	5052.66
Rio de Reyes.....	900.00	2952.85	San Agustin Juntas...	1530.00	5019.85
Tecomavaca.....	620.00	2034.19	Coyotepec.....	1600.00	5249.52
Rio Salado.....	600.00	1968.57	Cúspide.....	1900.00	6233.70
Campanario.....	730.00	2395.10	Santo Tomás Jaliera..	1830.00	6004.14
Organo.....	700.00	2296.67	Ocotlan.....	1720.00	5643.24
Pajarito.....	680.00	2231.05	Magdalena.....	1700.00	5577.62
Gavilan.....	600.00	1968.57	San Martin.....	1700.00	5577.62
Paraje Blanco.....	580.00	1902.95	Rio Coapa.....	1590.00	5216.71
Rio Seco.....	560.00	1837.33	Ejutla.....	1540.00	5052.66
Chonoslar.....	700.00	2296.67	Arrogante.....	1600.00	5249.52
Rancho de Urrutia...	620.00	2034.19	Chichovo.....	1840.00	6036.95
Rancho de Cuagulotal.	620.00	2034.19	Zopilote.....	1810.00	5938.52
Rancho de los Obos...	620.00	2034.19	Cúspide.....	1930.00	6332.23
Hacienda de Güendulain.	620.00	2034.19	Tlacuache.....	1840.00	6036.95
Rio Apoala.....	540.00	1771.71	Tepehuaje.....	1780.00	5840.33
Rio Tomellin.....	540.00	1771.71	Miahuatlan.....	1800.00	5905.71
Balconcillo.....	680.00	2231.05	Chapaneco.....	2230.00	7316.51
Rancho del Chilar....	660.00	2165.43	Agua del Sol.....	2400.00	7874.27
Infiernillo.....	660.00	2165.43	San José del Pacifico..	2600.00	8530.46
Don Dominguito.....	750.00	2460.72	Garganta del Encino..	2800.00	9186.65
Arroyo Dominguito...	720.00	2362.29	Tres Cruces.....	3160.00	10367.79
Arroyo de Nopala....	710.00	2329.48	Rancho de Canoas....	3000.00	9842.84
El Pochote.....	1240.00	4068.38	San Miguel Xuchistepec	2780.00	9121.04
Canton de Buena Vista.	1360.00	4462.09	Rio de San José.....	2340.00	7677.41
Cúspide.....	1500.00	4921.42	Cerro de Santa Ana...	2720.00	8958.56
Puente de la Joya.....	1400.00	3412.19	Cerro de San Pedro...	2500.00	8202.36
Venta Vieja.....	1600.00	5249.52	El Porvenir.....	800.00	2624.76
Paredones.....	1840.00	6036.95	Garganta del Cerro de la Pluma.....	900.00	2952.85
Llano del Timbre....	1900.00	6233.70	La Providencia.....	830.00	2723.19
Cieneguilla.....	2020.00	6627.51	La Soledad.....	750.00	2460.72
Portezuelo.....	2220.00	7283.70	San José Totoltepec...	530.00	1738.90
Las Trancas.....	2080.00	6824.37	Rio Chacalapa.....	340.00	1115.52
Carbonera.....	2160.00	7086.84	Pochutla... ..	160.00	524.95
Ojo de Agua.....	2100.00	6889.98	Puerto Angel.....	0.00	0.00

THE VALLEY OF MEXICO'S DRAINAGE.¹

Mexico is finishing a great work, the drainage of the valley where the capital city is located, which has required for its completion nearly three hundred years and many millions of dollars, and has cost the lives of hundreds of thousands of men. The necessity, importance,

¹ This article was published in the *Engineering Magazine* of New York for January, 1895 (vol. viii., No 4), but has since been revised and considerably enlarged.

and magnitude of this work, which will be classed among the grandest achievements of men, and the nearness of its completion, induce me to write this paper, which I hope will give some idea of its scope and purpose. I do not pretend to originality, as my work to some extent has been one of compilation from different monographs, which have appeared from time to time, and from some official publications of the Mexican Government.

Topographical Conditions of the Valley of Mexico.—The Valley of Mexico is an immense basin, of approximately circular shape with one extreme diameter of about sixty miles, completely bounded by high mountains, and having only two or three quite high passes out of it. No water drains out of the basin. The surface of this valley has a mean altitude above the sea of 7413 feet and an area of about 2220 square miles.

Mountain ranges rise on every side, making a great corral of rock containing dozens of villages and hamlets, with the ancient capital in the centre. In times past the fires of volcanoes licked up the earth, and such fires still live in the mammoth Popocatepetl, from whose great crater sulphur fumes and smoke with jets of flame have poured through the centuries.

The valley thus hemmed in with solid walls of rock had been an inland sea for many cycles, and during the early existence of man here the salt waters spread over a large extent of the depression. The waters have been gradually lessening by seepage and evaporation, and the Aztec pilgrims coming from the north in the fourteenth century, having received a sign that they were to build their queen-of-the-world city on a small island of the sea, set about building dikes and combating the overflow of the waters.

Evaporation is so excessive at certain periods of the year that malaria, consequent on drought, was far more dreaded by the inhabitants than the periodical floods, and thousands perished annually, so that proper drainage was an absolute necessity for the preservation of health.

Work done by the Indians.—Nearly fifty years before the discovery of America, which took place in 1492, Netzahualcoyotl, saw the necessity for a drainage canal, and commenced the work in 1450. He constructed an immense dike to divide the fresh from the salt-water lakes of the valley. The City of Mexico was at this time the centre of the Aztec nation, and was built on floating structures, like rafts, on the water in the numerous islets on the margins of the lakes, so that in the event of the water rising or the city being subjected to a state of siege, the whole city would float. Mexico City now occupies the site of the old Aztec capital.

The waters of these lakes were liable to disturbances of all kinds;

thus it is recorded by Prescott in his *History of the Conquest of Mexico*: "In 1510 the great lake of Texcoco, without the occurrence of a tempest or earthquake, or any other visible cause, became violently agitated, overflowed its banks, and, pouring into the streets of Mexico, swept off many of the buildings by the fury of its water."

When Cortez arrived in Mexico from Spain in 1519 to take possession of the country in the name of the King of Spain, he found, to his great surprise, the defense of the city admirably arranged, and an almost enchanting view of flowering islets forming the floating capital. Little towns and villages lay half-concealed by the foliage, and from the distance these looked like companies of wild swans riding quietly on the waves.

A scene so new and wonderful filled the rude heart of the Spaniard with amazement. So astonished was he at the extent of the water of Lake Texcoco that he describes it as "a sea that embraces the whole valley," but upon hearing that it was a lake, with a mean depth of a few yards, he gave orders to cut a way through the dike and destroy the aqueduct of Chapultepec. The central dike dividing the fresh from the salt water lake was of such dimensions as to serve Cortez as a roadway for his army.

Prescott, in the work before alluded to, page 297, says: "Leaving the mainland, the Spaniards came on the great dike or causeway, which stretches some four or five miles in length, and divides Lake Chalco from Xochimilco on the west. It was a lance in breadth in the narrowest part, and in some places wide enough for eight horses to ride abreast. It was a solid structure of stone and lime, running directly through the lake, and struck the Spaniards as one of the most remarkable works they had seen in the country."

Having cut the dikes and drained the lake, the "floating city" was at once besieged, and where originally stood the great temple of the Aztecs a Christian temple was afterward raised. The Spaniards, finding themselves in complete possession, proceeded to erect the new City of Mexico, and building on the plan adopted by them at home, they cut down the points of the floating islands and by gradual extension soon placed the town below the mean average level of the lake. Hence arose the great difficulties of the drainage of the Valley of Mexico.

One of the immense dikes built by King Netzahualcoyotl was ten miles long. It divided Lake Texcoco into two parts. Of the two lakes thus formed one was allowed to remain salt, but the other was freshened by letting only fresh water enter by the streams flowing in, the water for the use of the city being taken from this latter. Little by little the waters have subsided since that period, and have been fought back, until now they are confined to six great lakes—Chalco, Xochi-

milco, Texcoco, Xaltocan, San Cristobal, and Zumpango. Each of these lakes is fed by streams which have little volume during the dry season, but which in the rainy season swell to considerable size, and at times overflow the valleys. The lake of Zumpango was the most dangerous of these, for it received the waters of the Cuautitlan River, —a river draining a large area of country, and having during the rainy season a great volume of water. This river has been turned into the cut of Nochistongo, and has ceased to threaten Mexico and its environs with its overflow.

From these topographical conditions frequent floodings of the old Aztec city and of the Spanish capital, situated almost at the lowest point of the valley, were sure to come in times of unusually heavy rains. In early days, when the Aztecs lived in the middle of Lake Mexico, when their temples and wigwams were built on piles and the streets were often only canals, the periodical overflows from the upper lakes were a matter of small concern, though even then the Nahua engineers were called upon to protect the city by dikes. But when by evaporation, by filling in at the site of the city, by lessened waters, due to the fissures caused by earthquakes, Lake Mexico had disappeared, and the city had come to be built on the spongy soil, above all, when the short-sighted choice of Cortez had been confirmed and the capital of New Spain had come to stand on the ruins of the Aztec town, increasing rapidly in population and wealth,—it became a serious matter that on an average of once in twenty-five years the streets should be from two to six feet under water for an indefinite time.

Work done by the Spaniards.—From 1519 to 1553 the Spaniards were busily engaged in building Mexico, and another grand dike, similar to that built by Netzahualcoyotl in 1450, was formed around the city; this protection proved insufficient, for in 1580 another inundation took place. The Viceroy of the day, Señor Don Martin Enriquez de Almanza, assisted by engineers, engaged to find an outlet for the waters north of the valley. During the time they were thus engaged, important facts were gleaned respecting the River Cuautitlan, and its curious behavior at the foot of Nochistongo, whence it doubled its course at a certain altitude and ran toward Lake Texcoco, instead of into its own lake of Xaltocan. The scheme formed by Enriquez de Almanza to remedy this evil was kept in abeyance, as his services were required in Peru.

In the year 1604 a serious inundation attacked Mexico City. The Marquis de Montes Claros did all in his power to carry out the plan of Señor Don Martin Enriquez to relieve the rivers of the north and of the valley of the excess of water from the central and south lakes, which are of higher altitudes. The *pros* and *cons* of this plan were beset with many great difficulties, and respecting one of the methods

tried, mention must be made of a dike of great strength, constructed to prevent any excess or overflow of water from destroying the town of Zumpango and washing away its crops. This dike, which was to check the strong current of the river Pachuca, would also direct the river Cuautitlan to Mexico, direct the rivers north into Zumpango, and would inundate that verdant district, and probably submerge the town; whereas, to divert them into Lake Texcoco would submerge Mexico. To prevent this evil it was decided to make a tunnel; but here, as in all countries and in all ages, engineers, when engaged in any work of magnitude, and of a different character from that commonly known, always find theorists to offer objections, and thus stop the way to actual progress. This was the case in Mexico City.

In 1607 another inundation, spreading over the whole valley, occurred, and, as all the dikes and other defences were swept away, caused a panic of terror among the inhabitants. The Marquis de Salinas was then Viceroy at Mexico City, and determined to carry out the plan of Señor Don Martin Enriquez, being assisted by an engineer of great repute named Enrico Martinez, and also solicited and obtained the co-operation of Father Sanchez, of the Society of Jesus. These three men, after many consultations, formulated the plan of embracing the whole of the lakes of the plain into one main channel of detention, and an outlet as required to keep the same under such control as to have at all times an abundance of water for use. The plan, broadly speaking, was to draw off the water from the south lakes which are at higher levels to those of the north, and to make them serve, by the scour the velocity of the water would cause, to deepen the passage for their exit, and, at the same time, assist the making of the grand canal.

Great opposition to this plan was offered on the score of economy, and many insisted that the inundations were solely due to the waters of Cuautitlan and the freshets of Pachuca, and if these were directed north no more was needed, while the people of Zumpango tried to show that no more was needed to inundate their town and submerge the district. The Viceroy then requested Enrico Martinez to induce Father Sanchez to submit some modifications of his former scheme.

The plan was modified, and on November 28, 1607, Enrico Martinez started operations on the modified plan, and in about eleven months 6600 metres ($4\frac{1}{6}$ miles) of canal, with a transverse section of 3.50 metres ($11\frac{1}{2}$ feet) wide, and a depth of 4.20 metres ($13\frac{3}{4}$ feet), was completed. At the same time other important drainage works were being made; the passage was opened from Boca de San Gregorio to Salto de Tula; this was 8600 metres ($5\frac{1}{2}$ miles) long, as well as two canals as aqueducts $6\frac{1}{2}$ miles long, one for Lake Zumpango and the other for the river Cuautitlan from Teoloyucan to Huehuetoca.

In December, 1608, in the presence of the Viceroy Don Luis de Velasco and the Archbishop of Mexico, Enrico Martinez inaugurated the outlet of the waters, the whole of the work just described being executed in one year. Humboldt tells us that fifteen thousand native Indians were employed on these works.

In spite of the great good these works brought to the people, there was an outcry for economy, but it is certain that other motives prompted the disturbance and the attempt to harass and hamper the Viceroy. The object was to prevent a grant of money from being made to pay for the lining of the canal with cement. This was found to be necessary, as the greater part of the work was excavated in marl, and the liberated waters ran with such velocity that the symmetry of the tunnel was soon destroyed, and its passage and usefulness lessened by the *debris* that obstructed the fairway. This state of things was brought so forcibly home to the objectors that a small sum of money was reluctantly granted, sufficient to patch up the tunnel in places where the rush of waters had made the most havoc, hydraulic cement or mortar being used, but the sum granted proved to be totally inadequate, and for want of more money the tunnel was rendered perfectly useless by falling obstructions. This occurred in the year 1609. Gossips and theorists then united to run down the scheme, although it was conceded that the work had averted a terrible inundation or submergence of Mexico City.

A few years elapsed before the question of continuing the works for the tunnel again caused excitement; but a general feeling grew up that the work of the tunnel should be continued. The opposition was strong enough to obtain the hearing of an appeal in Madrid, with the result that the Spanish Government in 1614 procured the services of a Dutch engineer, named Adrian van Boot, to proceed to Mexico City to examine and report on the canal works, and to submit a plan to remedy the evils. As the result of his labors he condemned the plan of Father Sanchez, and recommended that the old means of defence used by the Indians should again be adopted, and that dams and dikes should be thrown up at once. This report had the effect of annoying almost everybody, and was the means of much fruitless discussion. In this dilemma the Spanish Government, when appealed to, confessed they were unable to advise the Viceroy of Mexico what to do, but sent the Marquis of Gelves to Mexico to see into matters, and he, having unbounded faith in the ability of the Dutch engineer, Adrian van Boot, and hoping to keep money in the treasury, ordered Enrico Martinez to close up the tunnel completely, and to return the rivers to their natural courses; but before these orders were half executed the enormous rush of waters grew so alarming that he had to accept again Enrico Martinez's plan over that of Adrian van Boot. The

marquis was soon after deposed, his place being taken by the Marquis de Cerralvo, whose first act was to set Martinez free at the request of the city council who provided him with means of continuing his work on the canal and tunnel. The Viceroy revoked his predecessor's order and issued another to open up the tunnel, and that with all speed, on his personal responsibility. Although Cerralvo gave these orders, he forgot to give Martinez the money to carry them out, and, as a consequence, the works remained in a deplorable condition.

The tunnel was blocked up by this cause, and Martinez was cruelly scored for not having done his work aright by the very ones who had refused to give him the necessary material for it. He bravely essayed to repair the damage, but the water-soaked condition of the ground gave no resistance for the building of the needed walls, while death mowed down the enslaved workers. They were crushed to death by the frequent cavings in of the loose soil, or were sent to the grave by the deadly damps. Finally, the charge being made that the builder was blocking up the tunnel in revenge, he was thrown into prison, where he languished for many months. As there was no one else available who could carry on the great work, he was afterwards released and again put in charge. It was then decided that, the tunnel being completely useless, the next thing to be done would be to make a great cut down to the tunnel and thus open it out. This entailed the making of an excavation fourteen miles in length with an average depth of one hundred and eighty feet and width of four hundred feet.

On June 20, 1629, the ever troublesome river Cuautitlan over flowed and inundated the north of the plain, and swept with it other streams into Lake Texcoco. In the September following the increase of the water was greater than ever had been known. The city was so suddenly and completely submerged that thirty thousand persons perished, the bodies floating about the streets for some time after. The destruction of property and life, consequent on the inundation, was so great generally, and affected the tunnel to such an extent, that during a period of five years there was scarcely any reduction in the height of the water, and the water in the city remained during all this time as high as the second story of the houses; the slight difference in the height of the water being caused by evaporation.

The Spanish Government at Madrid gave orders to change the capital to a better and more secure site. To this suggestion the citizens demurred, saying, in effect, that to insure complete security an outlay of only \$3,000,000 was necessary, this being the estimated cost of completing the tunnel, whereas to build a new city would involve an outlay of \$50,000,000, with a loss of another \$50,000,000 in leaving the old one.

Several plans were now submitted in opposition to that of Enrico

Martinez, and one by Simon Mendez was accepted, his plan being to direct all the waters of the valley by one canal into the neck of the Tula, the spot selected by Martinez for his outlet. It was soon discovered that the plan of Simon Mendez was far too costly, and as the money that could be spared was practically melting away without perceptible progress being made, Enrico Martinez was again requested to carry out the work as arranged with Father Sanchez.

The next Viceroy, the Marquis of Cadereita, was most desirous to see the work of the tunnel pushed on; but however enthusiastic he may have been, lack of funds prevented him from giving effect to his desires. The work continued very slowly, Martinez being unable to do any work at the tunnel, and he contented himself with improving the canal by lining it in bad places with cement. Martinez struggled on for thirty-seven years with this work, and died unnoticed and uncared for. All trace of his place of final rest was lost.

In 1637 an earthquake made sad havoc with the tunnel works, and for lack of funds no repairs could take place; but when funds were obtainable workmen could not be procured, the earthquakes and inundations having carried off many thousands of these poor fellows. The survivors lacked heart to return to such an unfortunate and, as they thought, accursed work.

In the year 1640 the work was being pressed on by men from the prisons, under the direction of the Franciscan monks, and carried on, with varying results, in this way for thirty-five years, until Señor Don Martin Solis was made head of the municipal council. He being an avowed enemy to the Franciscans, sent them away, and undertook the superintendence of the work himself; but his method of treating the prisoners was so harsh and cruel that they broke out into open revolt, and the works were threatened. Therefore, to save the works and his own life, he consented to the return of the Franciscans. It is estimated that up to this time some two hundred thousand men lost their lives on this work. The Franciscans steadily, but slowly, worked on, always with a very limited exchequer, until 1767, when there remained some 1935 metres (1 $\frac{1}{2}$ miles) still to be completed. A contract was entered into to finish this work in five years for \$800,000; but instead of five years it took twenty-two years, and, instead of 8 metres (25 feet wide), as contracted for, it was only 3 metres (9 feet 10 inches) wide.

The Spaniards continued the work in other hands for one hundred and fifty years before the task of opening the cut was completed. Spasmodic work for a century and a half led at last to the accomplishment of this project in 1789. The old tunnel of Martinez is now a gigantic trench from 30 to 160 feet in depth and some 300 feet broad in some places, and is known as the Tajo de Nochistongo. The immediate vicinity of the workings was depopulated of its native inhabit-

ants by the insatiable demands of the killing labor, and recruits were then drawn from Puebla and other thickly populated Indian centres. Great prison barracks were built on the bare hills, and here all the criminals were sent to enter the work. The ones in charge were indifferent with regard to the lives entrusted to their care, and the slaughter, of which scant record remains in the parish burial books, and which resulted from a combination of defects in appliances for both the safety and the comfort of the workmen, was terrific. As the burial trenches were filled with new dead, the depths of the cut were tenanted by new laborers.

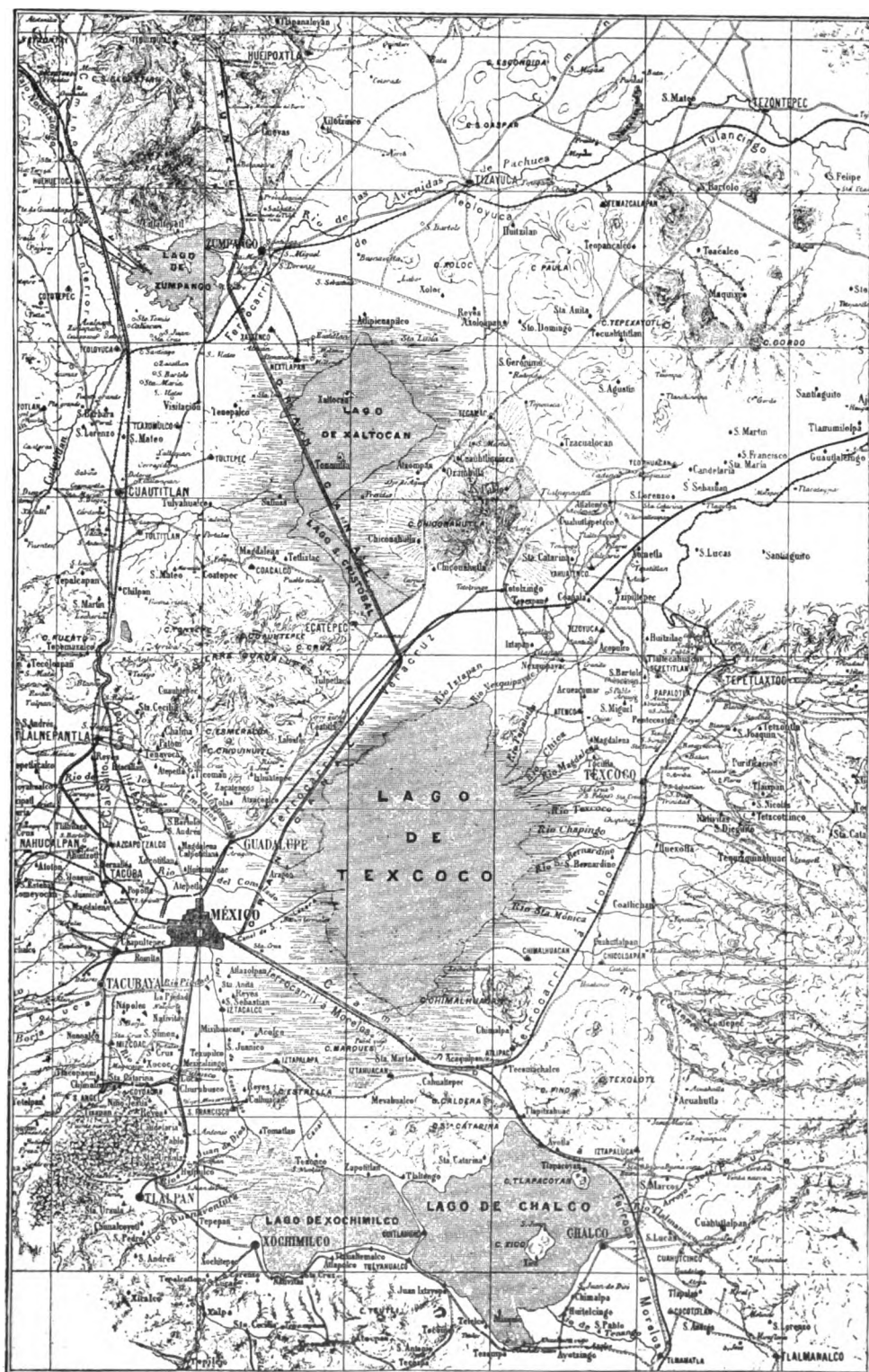
The victims of three years of bondage numbered fully two hundred thousand ere the work was done. Yet the results were but slight, only the excess of water from the highest lakes and streams being carried off. However, the danger from inundations of the city has been very materially decreased by the Nochistongo opening, and no more deluges have occurred since its completion.

Still the fact that the bottom of the cut was thirty feet higher than the surface of Texcoco, the lowest lying of the lakes, left the city in danger of inundation, as Lake Texcoco is constantly filling up at the rate of one and one-half inches a year and is now but a few feet below the level of the main plaza of the city.

The drainage works had long been a heavy burden upon the Mexican treasury. Up to 1637 Bancroft estimates that \$3,000,000 had been expended. Up to the year 1800 the outlay had reached \$6,247,670. Up to 1830 the total expenditure was \$8,000,000.

Work done by the Mexican Government.—The problem which the Mexican Government had to face was very different from that which confronted Martinez in 1607. The question of preventing submergence is practically solved. The work of Martinez, unsatisfactory as it was, did a great deal to solve it. Since his day the area of the lakes has been gradually diminishing. The rapid evaporation in the rarefied air and under the direct sun of the valley partly accounts for this. Twice the water in Lake Texcoco has almost entirely disappeared, leaving only a sea of mud and a small pool. The great problem which the Mexican Government has now solved is not how to prevent an inflow of water, but how to provide an outlet for sewage. The danger to be averted was not that of drowning, but that of dying from the plague.

Lake Texcoco more than any other now menaces the security of the capital. The unwise cutting down of forests since the Spanish conquest permits the waters pouring down into the valley to bring with them annually great quantities of alluvial matter, which have so much raised the lake bottom and the water level that inundations have been of frequent occurrence. The general level of the City of Mexico is only 6.56 feet above the surface of the lake. The rainy season lasts



MAP OF THE VALLEY OF MEXICO, SHOWING THE CANAL AND TUNNEL.

from June to October inclusive. During this season five times as much water falls as during the rest of the year, evaporation can no longer compensate for rainfall, and the valley is more or less flooded.

Originally built in the midst of a lake, the city has been left on dry ground by the receding waters. Lake Texcoco,—some three miles distant,—Chalco, and Xochimilco have altitudes nearly four feet greater than the pavement of the capital. Still more imperiously do the lakes to the north dominate the city. San Cristobal and Xaltocan are about five feet, while Zumpango is over thirteen feet, above it.

The project now almost completed is a modification of the scheme projected by Simon Mendez in the time of the Spanish Government, and which in 1849 was adopted by Captain Smith of the corps of American engineers which accompanied General Scott's army. The tunnel was ultimately located under the saddle and through the ravine of Acatlan, its mouth being near the village of Tequixquiac. The works have been begun several times, and then suspended without effecting anything of importance. In 1866 the works now nearing completion were commenced. A project proposed by Señor Don Francisco de Garay, a well-known engineer of the City of Mexico, was pronounced the most feasible. But the revolutionary struggle succeeded, and for many years the work was relegated to the back-ground.

In 1879 engineer Don Luis Espinosa, the present director of the works, took charge of the undertaking. In the first period mentioned the cutting of Tequixquiac was excavated, and the greater part of the shafts were begun; but at that point the work was stopped by political agitations.

The present gigantic work cannot have been considered to have been seriously undertaken, with a view of completion at any cost, until the year 1885, when the City Council of Mexico submitted a project to the Government to which they offered to contribute largely in the event of its being adopted.

A special commission, with ample authority to deal with the funds set aside for the work, was appointed by President Porfirio Diaz. The City Council set aside the sum of \$400,000 per annum for the canal works, which sum was materially increased by the Federal Government.

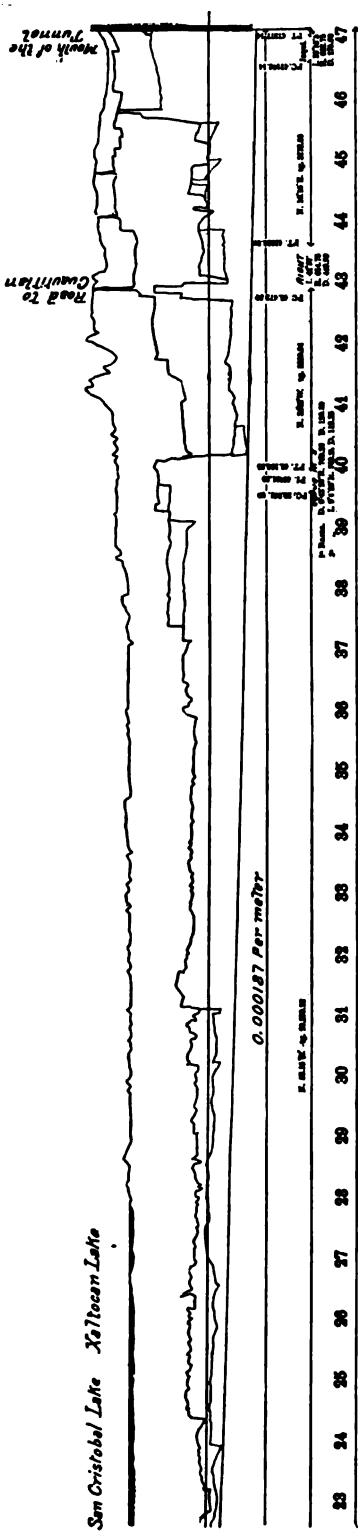
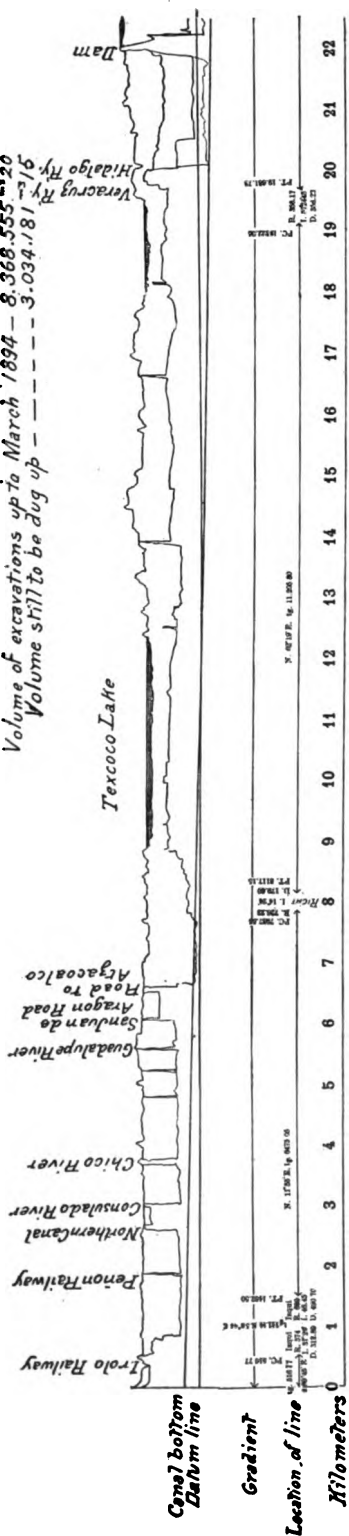
In 1887 the City Council raised a loan in London of £2,400,000 to meet the cost of the work and guarantee its successful termination. The entire responsibility of the work was now assumed by the City Council, and the Government gave authority for the Council to make and collect new taxes. Still, there was not sufficient money forthcoming, so another loan was raised in London for £3,000,000, a portion of which was held for the work.

The drainage works, when carried out, will receive the surplus waters and sewage of the City of Mexico and carry them outside of the valley, and will also control the entire waters of the valley, affording an outlet, whenever found necessary, to those which might otherwise overflow fields and towns, rendering the soil stagnant and marshy. The work consists of three parts—1st, the tunnel; 2d, a canal starting from the gates of San Lázaro, and having a length of $67\frac{1}{2}$ kilometres, or 43 miles, its line following on the eastern side of the Guadalupe range of hills and between that range and Lake Texcoco, changing its direction after arriving at the 20th kilometre to a northeasterly one, so as to diagonally cross Lake San Cristobal, a part of Lake Xaltocan, and a part of Lake Zumpango, and arriving finally at the mouth of the tunnel near the town of Zumpango; and 3d, the sewage of the City of Mexico.

The tunnel.—The contract for completing the tunnel was let to Messrs. Read & Campbell, of Mexico, but for some reason they were unable to finish the work. It was therefore continued and satisfactorily completed by the City Council for a sum considerably less than the price contracted with Messrs. Read & Campbell under their superintendence as hereafter stated.

The tunnel has a length of 10,021.79 metres, or 32,869 feet ($6\frac{1}{2}$ miles), with a curved section formed by four curves respectively of the following dimensions: The upper part has a span of 4.185 metres, or 13 feet 9 inches, and a rise of 1.570 metres, or 5 feet $1\frac{1}{2}$ inches; the two lateral arches have a chord each of 2.36 metres, or 7 feet 9 inches, a radius with a chord of 2.429 metres, or 8 feet, and a rise of 0.521 metre, or 1 foot $8\frac{1}{2}$ inches; the elevation is 4.286 metres, or 14 feet, and the greatest width is the span of the upper arch. The accompanying drawings show this section. The tunnel is lined with brick, having a thickness in the upper part of 0.45 metre, or 1 foot 6 inches, and in the lower part over which the water runs, of 0.04 metre, or 1 foot 4 inches in the side arches, and of 0.30 metre, or 1 foot in the radius, this latter lining being of artificial stone made of sand and Portland cement. The elevation of the invert at the beginning of the tunnel is 9.20 metres, or 30 feet $1\frac{1}{2}$ inches below datum; at the end of the tunnel, 17.53 metres, or 57 feet 6 inches below datum. The gradient is 0.00069 for the first 2170.74 metres, or 1 in 1449 for 7120 feet; 0.00072 for the following 5831 metres, or 1 in 1389 for 19,125 feet 6 inches; 0.001 for 5100 metres, or 1 in 1389 for 16,728 feet; and 0.00135, 1 in 740, for the rest of the tunnel; these changes being in accordance with changes of details made from those of the original project, in some cases modifying the section and in other cases the lining. Twenty-five shafts, each 2 by 3 metres, or 16 feet $6\frac{1}{2}$ inches by 9 feet 10 inches, were opened at a distance of 400 metres, or 1312

Volume of excavations up to March 1894 - 8,368,555 m³
 Volume still to be dug up - 3,034,181 m³



DRAINAGE OF THE VALLEY OF MEXICO **LONGITUDINAL SECTION OF THE** **MAIN CANAL**

SCALE
 Horizontal..... $\frac{1}{5000}$
 Vertical..... $\frac{1}{200}$

(This Cut was made in March, 1894, before the Canal was finished.)

feet from each other. These served to ventilate the tunnel and to facilitate the work. The deepest of these shafts, situated on the saddle of Acatlan, has a depth of 92 metres, or 301 feet 9 inches; the shallowest is 21 metres, or 68 feet 10 inches.

To give an idea of the labor involved beyond the mere tunneling, it is as well to mention that the quantity of materials required per lineal yard of tunnel was 1800 bricks, 94 cement blocks, 3 cubic yards of mortar, and 70 cubic feet of volcanic stone.

Maximum discharge through the tunnel = 18 cubic metres, 635½ cubic feet.

When the drainage board took charge of the work, it was executed by day labor both in the canal and in the tunnel, the latter having the larger amounts expended on it. But, shortly afterwards, the contract for the tunnel was let to Messrs. Read & Campbell, of London, who, after having invested a considerable sum in the work, found themselves under the necessity of cancelling their contract at the beginning of the year 1892. These gentlemen continued to handle the work, but as managers, and under the direction of the board.

The canal.—In December, 1889, the Department of Public Works contracted with the Bucyrus Company of the United States, of which Colonel Ellis was the president, for the construction of the canal.

This company started with two spoon dredgers capable of raising a maximum of 1000 cubic metres, 1308 cubic yards, a day. They commenced operations at the twenty-second kilometre. In the opinion of the board of commissioners, the Bucyrus Company was not proceeding with the work at a suitable rate of speed, for at 1000 cubic metres, 1308 cubic yards, per day, the work of dredging alone, as there were some 16,000,000 of cubic metres, 20,928,000 cubic yards, of excavation to do, would take about forty-three years; their contract was therefore cancelled.

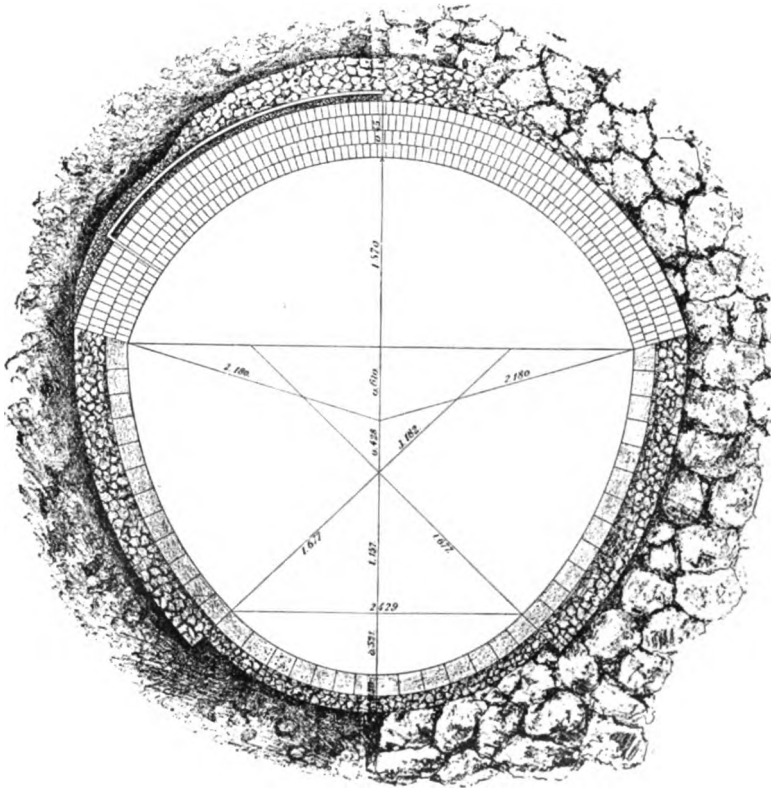
In May, 1894, the Department of Public Works of Mexico contracted with Messrs. S. Pearson & Son of London for the completion of the canal, modifying former contracts of December 25, 1889, March 30, 1891, and April 18, 1893, under the following bases: the unfinished excavation in the first nine kilometres, and that between kilometre 47 and the entrance of the tunnel of Tequixquiac, are to be continued by the Board of Drainage Directors, who must have the latter portion completed to 10 metres below the surface of the soil by December 31, 1894, and to the required depth of the canal by May 31, 1895, in order that the water in the canal may settle to that level and permit the contractors to slope the walls as required by the contract. The contractors are to complete the canal between kilometres 9 and 47 for the sum of \$3,506,000. For making the monthly estimates the canal will be divided into two sections—kilometres 9 to 22 and kilometres

22 to 47. In the first section the provisional estimate will be 40 cents per cubic metre; in the second a sum equal to the quotient obtained by dividing the remainder of the money by the number of cubic metres to be removed. The contractors may suspend the work of the dredgers when they fall below 40 cubic metres per hour, and can proceed with the excavation in any way they wish. The excavation had to be completed by May 1, 1896, except in the parts where the dredgers cannot work. Then for each day's delay the contractors must pay \$500 fine, and after five months the contract will be rescinded.

These contractors carried out the work of the canal in two different ways—by hand work with centrifugal pumps to draw off the water which filtered into the work, and by means of enormously powerful Couloir dredgers which have a capacity for 3000 cubic metres of excavation per day, and which throw the excavated earth to a distance of more than 200 metres from the centre of the canal. They had five of these dredgers at work, and by means of them excavated to a depth of 20 metres or 65 feet, raising the earth to an elevation of more than 16 metres, 52½ feet, so as to empty it into the shoots, along which it was carried by a stream of water that delivered it at a considerable distance from the dredger. The dredgers have now done their work, and they have been taken to pieces, packed and transferred to the harbor works at Veracruz. The portion of the canal contracted for was completed to the satisfaction of all concerned in six years.

The level of the bottom of the canal above the datum line adopted is 2.25 metres, or 7 feet 4 inches, and the mouth of the tunnel is 9.20 metres, or 30 feet ½ inch below the same datum, supposed to pass 10 metres, or 33.80 feet below the bottom of the Aztec calendar stone, since transferred to the National Museum. The level of the ground at the beginning of the canal is 8.94 metres, or 29 feet 4 inches, and at the end 15.86 metres, or 52 feet above datum. The uniform slope of the canal is at the rate of 0.187 per kilometre.

The canal has a depth, at its commencement, of 5.50 metres, or 18 feet, which in the last few kilometres is increased to 20.50 metres, or 67 feet 3 inches. The side slopes were projected with a batter of 45 degrees, and the width of the bottom is 5.50 metres, or 18 feet for the first 20 kilometres, or 12½ miles, and 6.50 metres or 21 feet 2 inches in the rest of the canal. The first 20 kilometres, or 12½ miles, may be considered as a prolongation of the net of sewers in the city, and will receive only the water that passes through them. The flow is calculated for an average of 5 cubic metres, or 176½ cubic feet, although, when heavy rains require it, they can receive a greater volume; the rest of the canal communicates with Lake Texcoco, and will be utilized in controlling its waters,—the lowest in the valley,—which can be made to flow into the canal from all parts. Hence the canal has been built to



(Drainage of the Valley of Mexico.)

VERTICAL SECTION OF THE TUNNEL.

carry the largest flow that can pass through the tunnel, or 18 cubic metres, 635½ cubic feet, per second. The cutting is through a strictly clay formation, comprising occasional thin strata of sand and sandstone.

For accommodation of railroads, wagon roads, and water-courses, it was necessary to construct five aqueducts—four of masonry and one of iron—to carry rivers, four iron bridges for the passage of railroads, and fourteen bridges for vehicular traffic.

The sewage.—The sewers of the City of Mexico form a network of covered channels, located sometimes in the middle and sometimes on the sides of the streets, these being almost always gorges, communicating with a system of secondary sewers that empty into a collecting sewer discharging into the canal of San Lázaro, which transports the sewage to Lake Texcoco. If the water is high in the lake, water backs up into the sewers and saturates the soil under the houses and streets. As this has been the condition for several centuries, the state of the subsoil under the city can be better imagined than described. The death-rate touches 40 per 1000—the highest in the civilized world. Mexico's elevation of over 7000 feet is all that saves it from a pestilence. Malarial and gastric fevers are almost continually epidemic.

For a century the problem has been settling into one of pure sanitation. The plans which the Government has been working since about 1883, though called plans for draining the valley, really seek to get a fall sufficient to dispose of the sewage. In fact, in the original plan, from considerations of economy, care was to be taken to keep out of the projected canal all water both from the surface of the valley and from the rivers. The Consulado and the Guadalupe rivers were to be carried over the new canal in iron aqueducts. The drainage system was thus to be simply a part of the sewage system of the city.

The excavated materials have been tipped on each side of the canal at their natural slopes, and a towpath near the canal level provided. Sluice gates will direct the city drainage either to the canal or to Lake Texcoco. A sluice gate at the junction of the smaller with the larger part of the canal will control the flow of Lake Texcoco, and another sluice gate will be placed at the entrance of the tunnel.

Completion of the work.—As this paper goes to press, the drainage works of the Valley of Mexico are practically finished, as the waters of the valley have been for several years passing through the canal and the tunnel to their outlet in the river which takes them to the Gulf of Mexico, and the company with whom the canal was contracted is now giving the finishing touches to the sides and bottom of the canal and will deliver it to the Government Board of the Drainage Directors in January, 1898. It was agreed with the contractors that the portion of the canal between the City of Mexico and the 20th kilometre, which is comparatively easy, because the canal is not deep there, and the ex-

cavations do not exceed 200,000 cubic metres, will be made directly by the Board as soon as the other portion of the canal has been finished; this last section of the work is expected to be finished in June, 1898, when the waters of the City of Mexico will leave the valley by the drainage works here mentioned.

The canal and six-mile tunnel through the mountain range have a total length approaching fifty miles. The present works will take rank with the great achievements of modern times, just as the immense "cut" of Nochistongo, their unsuccessful predecessor, was the leader among ancient earthworks in all the world. The completed system will have cost \$20,000,000.

I have dwelt on these works at some length, because their importance to the City of Mexico can hardly be overestimated. Instead of being one of the healthiest cities in the world, as it should be with its magnificent climate and situation, Mexico, unfortunately, has a terribly heavy death-rate, due principally to want of drainage and generally bad sanitary condition. When the existing danger of floods is removed, and the sanitary evils are remedied by a proper system of drainage, the increased security that will be enjoyed by life and property will certainly have its effect on the prosperity of the city. Property will rise in value, the population will grow with rapidity, not to mention the tide of tourists that will set in from the United States, and this will mean larger revenues for the municipality.

I could not well finish this paper without paying General Diaz, President of Mexico, a just tribute for the great interest he has taken in having this gigantic work brought to a close during his administration. To his exertions in this regard, and to his commanding position in Mexico, more than to anything else, this happy result, now in sight, is due. So after a weary search of centuries for relief, the beautiful Valley of Mexico will gain its deliverance not only from the engulfing floods, but from the sanitary evils which have long resulted from defective drainage.

INDEX.

A

Agave, where found, 48 ; use, 48, 49
 Agriculture, products, 243, 244
 Alfalfa, how grown, and uses, 56
 Alligator pear, use, 63
 Americans in Mexico, cannot compete with Spaniards in frugality, 79 ; some Mexicans were afraid the country would become Americanized, 80
 Area, of Mexico, 5, 91 ; of silver mines, 13 ; of City of Mexico, 98, 107
 Army, strength of, 99, 100

B

Bananas, where grown, cost, yield, and size, 61 ; export of, variety, an article of food, 62
 Bancroft, H. H., referred to, 108 ; his statistics on drainage of Mexico, 274
 Banks, names of, 131, 225, 226 ; National Bank of Mexico, 131 ; Bank of London and Mexico, 132
 Bees, 71, 72
 Belize, occupied by, 6 ; boundary of, 7
 Birds, 71, 72
 Bolson de Mapimi, 12
 Boundary of Mexico, with the United States, 5 ; with Guatemala, 6 ; with Belize, 6, 7
 Brocklehurst, 109
 Bucyrus Co., 277
 Bustamante, Don Alejandro, 15

C

Cables in Mexico, where located, 123
 Cactus, species, 51
 Cadereita, Marquis of, Viceroy, 273
 Canaigre, use, where found, 55
 Canal, size of, 270, 278, 279 ; lining of, report on, 271 ; sum appropriated for building of, and loan, 275 ; contracted by, articles of contract, 277, 278 ; how work carried out, 278 ; flow, 278, 279 ; length of, 280

Castillo, Bernal Diaz del, 19
 Catholics, wealth of, 93, 94
 Cattle, raising, export of, 56-8 ; cost of fattening, lack of water, 57
 Cerralvo, Marquis de, his plan in regard to canal and tunnel, 272
 Cession of territory to the United States, by the treaty of Guadalupe Hidalgo, by the Gadsden treaty, by treaty signed at Washington with Mexico, 7, 8
 Charcoal, 4
 Chewing-gum, demand, production, 53 ; value, 54
 City of Mexico, location and settlement of old city, 107, 108, 267-9 ; present city, 108, 109, 268 ; public buildings, 109, 110 ; factories, 110 ; mortality, 111, 114, 115, 279 ; threatened by an inundation in 1604, often flooded in the early days, 269 ; plan to change capital, 272
 Climate, rainfall, 35, 36 ; temperature, 36, 37 ; climatic conditions, 37, 38 ; meteorological observations taken in several cities of Mexico, 38, 40, 41 ; meteorological observations taken in several localities of Mexico, 39 ; Mexico as a sanitarium, 41, 42 ; of City of Mexico, 110, 111 ; meteorology in the Mexican Republic, 111, 114 ; climatological data of the City of Mexico, 112 ; summary of meteorological observations of the City of Mexico, 113 ; good for work, 128 ; of City of Mexico, 274, 275
 Clouds, 38
 Coal, cost of, and mining, 22 ; coal-fields, 23-5
 Cochineal, where cultivated, price, 53
 Cocoa, where produced, 51, 52 ; disadvantages of raising, 52
 Cocoa-nuts, where grown, use, 62, 63
 Coffee, best location, production, 44, 45 ; advantages and disadvantages of raising, 127
 Coinage of precious metals, gold and silver, 21 ; mints, 27, 109

Colleges and universities established by the Spaniards, 100-102
 Copper, quality, amount produced, 22, 23
 Cortez, Hernan, reference to, 19, 55, 123, 268, 269
 Cotton, best location, expense of production, 48; seed, 24
 Courts, Supreme Federal, 26

D

Debt of Mexico, bonds, loans, etc., 129, 130; accomplishing credit, 130; amount of debt, 130, 131; National debt to June 30, 1896, 221, 222
 Dering, Sir Henry, quotations from, 47, 54, 55, 64
 Diaz, President, referred to, 115-18, 122-4, 130; tribute to, 280
 Dikes, first dike in 1450, 267; description of, by Prescott, 268; one built by Spaniards, 269
 Domestic animals, 71, 72
 Drainage works of the Valley of Mexico, where article on, was first published, how long to complete work, 266; magnitude of work, 267; by the Mexican Government, 274-6; works consist of, 276; works completed, 279, 280; importance to the City of Mexico, 280

E

Egypt, compared with Mexico, 10, 11
 English in Mexico, immediately after the independence, nearly all disappeared, 79
 Espinosa, Don Luis, present director of tunnel work, 275
 Expenses, amount of, 137, 138; of Federal Government, 139-41; of custom-houses, 147; of internal revenue, 148; of direct taxes, 149; of Mexican States, 151; of municipalities, 153; of Mexico in the year 1896-97, 245
 Exports, from 1826-28, 155; from 1877-96, 159; by countries and custom-houses from 1894-96, 160; value of metals and commodities exported in 1895-96, 161; of commodities from 1886-96, 162; of agricultural products from 1877-96, 164; destination and value of metals and commodities from 1882-92, 168, 169; total exports, 169; value of Mexican exports during 1872-73, 172; from Mexico and to the United States, 173; of domestic merchandise to Mexico 1858-83, 178-80; from the United States to Mexico 1889-97, 182, 183; articles exported from the United States to Mexico, 184, 185; tropical products supplied by Mexico to the United States, 185, 186; cattle exported to the United States, 186; of precious metals and minerals in

the years 1879-80, 1889-90, and 1894-95, 188; of silver, of silver bullion, 189; of silver ore, 190; of gold, 190, 191; of gold from Mexico to the United States, 192; of Mexico by countries and custom-houses in the year 1896-97, 246; Mexican exports to the United States, 247

F

Financial condition, of Mexico, 126, 137, 138; of railroads, 119, 120, 195, 196; of banks, 132; of States and municipalities, 154
 Fish, 71, 72
 Flora in Mexico, products raised, 42, 43; flowers grown, 63, 64
 Foreign immigration, encouragement to, 125; difference of, from the United States, 126, 127; cost of labor, 127; warning from consular reports, 127, 128; those who should immigrate, 128
 Foreign trade, small before railroads built, cost of transportation, 154; amount of, with United States, 170; why difficult to have correct data with United States, 170, 171; commercial transactions between Mexico and the United States from 1820-50, 173; commerce in merchandise between the United States and Mexico from 1851-97, 174; total commerce between the United States and Mexico by years and decades from 1851-97, 175; increase of trade during 1896-97, 184; between Mexico and the United States during the first nine months of 1897, 247
 Forests, 37, 38; destruction of, 65, 66; in Mississippi Valley, 66
 Forey, Marshall, 108
 Franciscan monks, work done by, 273
 French in Mexico, own large dry-goods houses, 79
 Fuel, 23-5; demand for, 24; consumption of, 64

G

Garay, Señor Don Francisco de, plan for tunnel, 275
 Gelves, Marquis de, his orders about tunnel, 271
 Geology, rock formations, 12; rich in ores, 12, 13
 Germans in Mexico, succeeded by English, and are doing well, 79
 Gil, Mr. George, *British Colonies*, 6
 Ginger, yield, 55
 Gold, where found and how reduced, 14, 19, 20; amount of production, extract from Mr. Cramer, 20; weight and standard value, 133; production of, in years 1879-80, 1889-90, and 1894-95, 188; accredited to Mexico, 192

Government of Mexico, 98, 99
 Grasses, where grown, use, 56
 Guatemala, boundary, latitude, length of southern boundary, 6; cochineal raised there, 53
 Guggenheim, smelter, 23, 28, 29

H

Henequen, where grown, average pounds per acre, 49
 Humboldt, Baron von, reference to, 13, 15, 81, 104, 271
 Hydrography, coast, gulfs, harbors, bays, 32; islands, 33; rivers and torrents, 33, 34

I

Imports, from 1826-28, 155; from 1872-75, 156; from 1885-86 and 1888-90, 157; from 1892-96, 158; by countries from 1888-90, by custom-houses from 1894-96, 160; values of metals and commodities from 1882-92, 165-7; résumé of total, 167; to Mexico and to the United States, 172; of merchandise from Mexico from 1858-83, 176, 177; into the United States, 181, 182; leading merchandise imports from Mexico to the United States, 184; of gold bullion, ore, and coin into the United States, 191; of Mexico by countries and custom-houses in the year 1896-97, 246; from the United States, 248
 Indians, Mexican, tribes, 72; classification of tribes, 73; similar to Malay-Asiatic races, 73, 74; extract from San Francisco, Cal., *Bulletin*, 73; characteristics, 74, 75; prominent men among them, marriages, 74; education, 76, 105; strength, 78; religion, 97; Sir William Hingston on, 75; originated work on canal, 267-9
 India-rubber, places best adapted for it, 46, 47; as an industry, amount of production, 46; profits and expense of, 47, 48
 Inhabitants, most thickly inhabited parts, 37; manner of living, 128; aborigines, per cent. of, 72
 Inundations of the City of Mexico, used to be flooded once on an average of every twenty-five years, the one in 1580, in 1604, 269; one in 1607, 270; one which occurred in 1629, 272; decrease in, since Nochistongo opening, caused by cutting of forests, 274
 Iron, where found, 21, 22, 25; Cerro del Mercado mine, quality, 21; importation of, foundries, 22
 Irrigation, but little at present in Mexico, 63; scarcity of water, 64, 65; cause of decrease in rainfall, good investment, 66; reason for short grain supply, 70; Nazas irrigation, 67-70

L

Lakes, number of, description of, 268, 269; disappearance of Lake Mexico, 269; Lake Texcoco filling up, lake almost disappeared, 274; altitudes of, 275; canal crosses Lake Texcoco, 276
 Lamoreaux, map showing cession of territory, 7
 Languages in Mexico, varieties, 85, 86; Indian, similar to Oriental, 74; synopsis of Indian, 86-8
 Latitude, of Mexico, 5; of Guatemala, 6; of silver mines, 13; of City of Mexico, 107
 Laws, mining, 25-7; lands, 124; colonization, 125, 126; banking, 131
 Lead, ores, 17, 18; yield, 28, 29
 Lemons, where grown, 60
 Lemprière, *Notes on Mexico*, 9
 Libraries in Mexico, 106; names, number of volumes and students, 233-5
 Li Hung Chang and the Mexican silver mines, 18, 19
 Limes and shaddock, where planted, variety, 61
 Longitude, of Mexico, 5; of silver mines, 13; of City of Mexico, 107

M

Mamey, use of, 63
 Mangoes, cultivated taste, transportation of, 63
 Manufacturing, factories in 1893, 236; additional establishments, 237
 Martinez, Enrico, his plan for canal, 270; plan inaugurated, 271; plan accepted in 1614, 271, 272; scored for not doing his work right, 272; referred to, 272-4; again requested to carry out work, 273
 Matthews, Mr. James F., 18
 Maximilian, 108; downfall, 95
 Mendez, Simon, his plan for canal, 273; reference to, 275
 Mercado, Gines Vazquez del, Cerro del, 21
 Mexico as a Central American State, where article was published, 249; how article originated, 249, 250; geographical situation of Mexico, 250; five States of Central America, 250; States of Mexico, 251; geographical extension of Central America, 251; how remarks were received by a Guatemalan representative, 252
 Miller, Mr. Chas., 18
 Mining, richness of mines, 13; miners, 25; Mexico offers great advantages in, 128, 129
 Money, weights and measures, 133, 134
 Montes Claros, Marquis de, reference to, 269
 Museum, National, 103

N

Navigation, number of vessels, 237; vessels arrived at Mexican ports in 1895, 238; vessels departed from Mexican ports in 1895, 239; foreign passengers arrived at Mexican ports in 1895, 240; foreign passengers departed from Mexican ports in 1895, 241; résumé of vessels and passengers arrived and departed by rail and ports in 1895, 242; vessels arrived and departed from Mexican ports in 1894-96, 243
 Navy, strength of, 100
 Netzahualcoyotl, saw the necessity for a drainage canal, 267; one of the dikes built by, 268
 Newspapers, 106
 Noyes, Theodore W., Mexico and Egypt, 10, 11

O

Ophidians, 71
 Oranges, where and how raised, irrigation, distillation, 59; flavor, yield compared with coffee, Frederico Atristain referred to, the cyclone in Florida, 60
 Orography, mountains and plateaus, 29-32; elevation of mountain ranges, 31

P

Papaya, use, 63
 Patents, number of, 132
 Pearson, S., & Son, contractors for canal, 277
 Peat, 23, 24
 Peppermint, where grown, 55
 Pineapples, uses, where grown, 62
 Political organizations of Mexico, of Federal Government, 98, 99
 Political parties, Church, its wealth, 93, 94; Liberal, 94
 Population of Mexico, increase of, 76, 77; decrease of Mexican Indians, 77, 78; from 1795 to 1895, 89; parts most thickly settled, 90; of United Mexican States, 91
 Position of Mexico, 9
 Postal service, number of offices and agencies, 123, 124; mail carried, receipts, 133; post-offices in Mexico in 1895, 223; earnings and expenditures of post-offices from 1869-96, 224; number of postal pieces transported from 1878-95, 225
 Prescott, *History of Conquest of Mexico*, 268
 Profiles, Mexican, from Veracruz to Mexico by the Mexican Railway, from Apizaco to Puebla, a branch of the Mexican Railway, 253; from Veracruz to Mexico by the Interoceanic Railway,

from the City of Mexico to Morelos by a branch of the Interoceanic, 254; from Puebla to Izúcar de Matamoros, a branch of the Interoceanic, 255; from the City of Mexico to El Paso del Norte by the Central Mexican, 255-7; from Aguascalientes to Tampico by the Mexican Central, 257, 258; from Irapuato to Guadalajara, a branch of the Mexican Central, 258; from the City of Mexico to Laredo Tamaulipas by the Mexican National, 258-60; from Acámbaroto Pátzcuaro, a branch of the Mexican National, 261; from Piedras Negras to Durango by the Mexican International, 261, 262; from Sabinas to Hondo, a branch of the Mexican International, 262; from the City of Mexico to Cuernavaca and Acapulco, 262, 263; from Puebla to Oaxaca by the Mexican Southern, 263; from Coatzacoalcos to Salina Cruz by the National Tehuantepec, 263, 264; from the City of Mexico to Pachuca by the Hidalgo and Northeastern Railway, from San Augustin to Irolo, a branch of the Hidalgo Railway, 264; from Durango to Mazatlan by bridle path, from Manzanillo to Guadalajara by wagon road, 265; from Tehuacan to Oaxaca and Puerto Angel by wagon road, 266

Publications about Mexico, non-official, 134; newspapers, 228
 Public lands, granted to Indians and Spaniards, survey of, 124; division of, 124, 125; price of, 125; titles of, 227, 228
 Pulque, where and how cultivated, 48, 49; fermentation of, expense and profit, 50; thorn and root useful, 51
 Purpose of this paper, 244

Q

Quicksilver, production of, 23

R

Railway itineraries (*see* Profiles)
 Railways in Mexico, history of, 115, 116; extent, 116, 119; President Diaz's policy on, 117, 118; President Diaz's statistics on, 119; financial condition of, 119-21; length of, passengers and tons carried, 133; mileage in operation October 31, 1896, 193-5; résumé of, 195; Mexican Central, 196, 197; Mexican National, 196-8; Mexican International, 199, 200; Mexican Southern, 200, 201; Mexican Railroad, 201; Interoceanic Railway, Sonora Railway, Hidalgo and Northeastern Railway, 202; Mérida and Progreso Railway, Tehuacan and Esperanza Railway,

Railways in Mexico—Continued.

Mérida and Peto Railway, 203; Sinaloa and Durango Railway, Mérida and Campeche Railway, Mérida and Valladolid Railway, 204; Tlalmanalco Railway, San Juan Bautista and Carrizal Passenger Railway, San Andres and Chalchicomula Railway, 205; Orizaba and Ingenio Railway, Santa Ana and Tlaxcala Railway, Cárdenas and Rio Grijalva Railway, 206; Toluca and San Juan de las Huertas Railway, Vanegas, Cedral, Matehuala, and Rio Verde Railway, Mérida and Izamal Railway, San Marcos and Nautla Railway, 207; Monterey and Gulf Railway, Cordova and Tuxtepec Railway, Maravatio and Cuernavaca Railway, Salamanca and Santiago Valley Railway, 208; Monte Alto Railway, Valley of Mexico Railway, Puebla Industrial Railway, Mexican Northern Railway, Mexico, Cuernavaca, and Pacific Railway, 209; Federal District Tramways, Veracruz and Alvarado Railway, 210; traffic and receipts of Mexican railroads, 211; subsidies paid by Mexican Government to June 30, 1896, 212-20

Read & Campbell, Messrs., contractors of tunnel, 276, 277

Real del Monte, 15-17

Religion in Mexico, Catholic clergy and convents, 92, 93; in politics, 94; Catholics of to-day, 94, 95; Protestant missionaries, 95-7; Protestant churches established by Mr. Henry C. Riley, 96; statistics on Protestants, 97, 98

Revenue, increase, 137; difficult to get data, 138; statistics of, from 1808-67, 139; statistics on, from 1867-88, 140; statistics on, from 1888-96, 141; Federal appropriations from 1868-95, 142; sources of, import duties, 143; additional import duties, export duties, 144; custom receipts, 145, 146; internal revenue, 146, 147; direct taxes, 148, 149; of Mexican States, 150; of municipalities, 152; of Mexico in the year 1896-97, 245

Rice, how cultivated, 53

Ruins in Mexico, Uxmal, 80, 81; Palenque, Cholula, 81; Teotihuacan, 81-83; Mitla, 83; extract from Sir Vivien Cory on, 83-5

S

Sanchez, Father, plan for tunnel, 270; plan condemned, 271

Sandy Plains of Mexico, 12

Sanitarium, Mexico as a, 41, 42

School of Engineering, 103

School of Medicine, 102, 103

Schools, statistics of, 105, 106; public, 229, 230; private, 231, 232

Sewage of the City of Mexico, danger of, 274; description of, and how to be effected, 279

Sheep, mistakes made in raising, 58

Shipping, mercantile marine, vessels in foreign and coasting trade, tons carried, 133

Silk culture, where grown, varieties, 52; how sold, 53

Silver, yield, and where found, 13, 14; system of reduction, 14; history of some mines, 15, 16; duties on, 28; weight and standard value, 133; total coinage of, 186; total production of, coined by Mexican mints from 1535 to 1895, 187; production of in the years 1879-80, 1889-90, and 1894-95, 188; coined and exported from 1874-96, 189

Smelting plants, Mexican Metallurgical Co., 28; National Mexican Smelter at Monterey, 28, 29; Central Mexican Smelter, Velardeña Mining Co., The Chihuahua Mining Co., The Mazapil Copper Co., Limited, Sabinil Mining and Smelting Co., Chihuahua, La Preciosa, The Boleo Smelter, 29

Smith, Captain, referred to, 275

Spaniards in Mexico, characteristics, 78, 79; climate check on growth, little education, 79; built dike for canal, 269

Starr, Professor, his theory, 76

States of Mexico, classification and division, etc., 90, 91

Sugar-cane, size, places best adapted for raising, cost of raising, 45

Switzerland, compared with Mexico, 10

T

Technical schools, at the present time, 103, 104; reorganization of, 104, 105

Tejada, Señor Lerdo de, 115

Telegraphs, number of different companies, 121-3; length of, 133; earnings and expenditures from 1869-96, 224

Telephones, length of, 133

Terreros, Don Pedro José Romero de, 15, 109

Texas, annexation of, 7

Tobacco, quality of, 45, 46

Topia, new mines, 17

Trade-marks, number of, 132, 133

Transportation, of money, 131; cost of, railroads have revolutionized, 154, 155; of mangoes, 63; of postal pieces, 225

Treaties, Guadalupe-Hidalgo, Gadsden, one signed at Washington between the United States and Texas, 7, 8

Tunnel, originated, 270, 271; blocked up, 272; work carried on in 1614, closed, 271; opened out, 272; earthquake destroyed it in 1637; condition of old tunnel now, 273; dangers

Tunnel—Continued.

in building, 273, 274 ; location of, 275 ;
contract for, size, 276, 277 ; discharged,
managed by, 277 ; length of, 280

V

Valley of Mexico, its development, 106,
107 ; topographical conditions, 267

Van Boot, Adrian, sent to make a report,
his plan, 271

Vanilla, where grown, production, varie-
ties, etc., 52 ; how sold, 53

Vegetation, 36

Velasco, Viceroy Don Luis de, 271

W

Wages, advantages of foreign labor, 48 ;
prevents immigration to Mexico of
poor people, 126-9

Warner, Charles Dudley, Mexico com-
pared with other countries, 10 ; climate
of Mexico, 42, 43 ; on church edifices,
92, 93

Water, Mr. J. A., Pinos Altos Gold
Mine, 14

Winds, 38

Woods, cabinet and dye, where grown,
some of the species, 43, 44, 55

Y

Yuca, when and where grown, 54 ; yield
55

Yucatan, configuration, civilization, 9

Z

Zapote, use, 63

Zones, products of cold, temperate, and
hot, 58



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